Full Throttle™

The Microsoft® Flight Simulator™ Pilot's Journal

June/July 1995 Vol.2 No.4
$8.95

FS 5.1 arrives!
See page 10!

FS5 resources on CompuServe and AOL

Short-field takeoff and landing

"Cross Country" flies over the Puget Sound

Building your own rudder pedals

3-D clouds in FS 5.0

Simulation news

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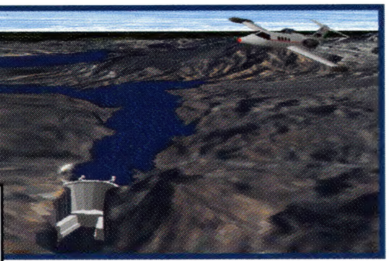

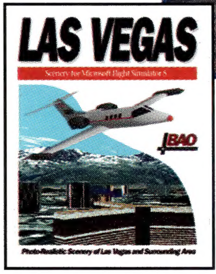
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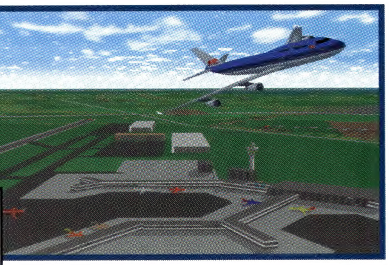

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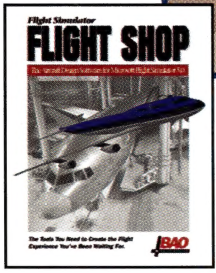
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Full Throttle™

The Microsoft® Flight Simulator® Pilot's Journal

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Pilot's Note:

All information in *Full Throttle* is intended for use with Microsoft Flight Simulator (version 5.0 and higher) only. This information is not intended for use in actual flight situations. While the maps, logs and other information are as realistic as possible, you should not use them for actual flying instruction. Safe flying!

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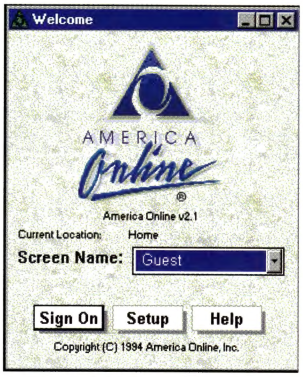

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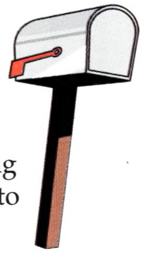
Cover: *Full Throttle* subscriber Larry L. Meyers, of Bellevue, Wash., used a computer graphics program to superimpose an FS5 Learjet over a photo he took of the U.S. Navy's crack Blue Angels aerobatic team.

A batch file to solve a sound problem



I want to point out a problem that I discovered when I purchased a new Sound Blaster 16 sound card for my system. Previously, I was using a Sound Blaster Pro card and was having no trouble whatsoever with Flight Simulator 5. The problem with the Sound Blaster sound card concerns the default setup for Sound Blaster's 16-bit capabilities. By default, the 8-bit Direct Memory Access (DMA) channel is set to 1—the same setting as for the Sound Blaster Pro—and the 16-bit channel is set to 5. These settings seem to cause an unexplained conflict with the engine sounds on the Learjet.

After talking to Microsoft technical support, I was told that I would need to change my sound card setup to play only 8-bit sound. This configuration seemed like a waste of money to me, getting only 8-bit sound from a 16-bit card, so I experimented with an FS5 startup batch file, and so far it seems to be working. Here's what I have:

```
@ECHO OFF
SET BLASTER=A220 I7 D1 H1 P330 T6
(This statement sets the card to 8-bit sound.)
FS5
SET BLASTER=A220 I7 D1 H5 P330 T6
(This statement returns the card to 16-bit sound.)
CLS
```

As I said, this batch file seems to be working *so far*. I haven't given FS5 a thorough testing to see if the engine sounds will cut out again.

Russell D. Hamm
Mountain Home Air Force Base, Idaho

Thanks for your letter, Russell. Your batch file changes the BLASTER environment variable every time you run FS5 to disable the card's 16-bit channel. The file then returns the BLASTER variable to its default configuration when you shut down FS5. Your solution seems to find a happy medium between accepting the sound problem in FS5 and abandoning your Sound Blaster card's 16-bit functionality altogether.

By the way, if you don't want to change your BLASTER environment variable (or the batch file for some reason doesn't work for you), there's a quick fix you can use if the engine sound starts behaving strangely in FS5—just press the [Q] key twice in rapid succession. Doing so turns the sound off and then on again; this action appears to solve the sound problem temporarily.

One of our airports is missing

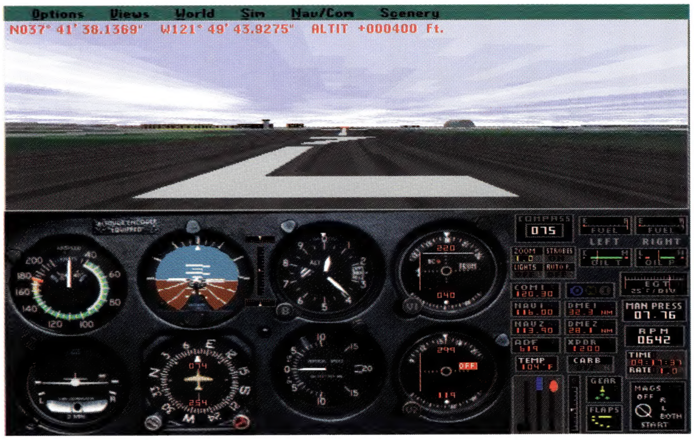
I live near Santa Cruz, Calif., and enjoy flying in Mallard's San Francisco add-on scenery. I recently flew east from Livermore airport on my way to the Tracy airport indicated on the San Francisco sectional map on page 229 of the Flight Simulator 5 *Pilot's Handbook*. To my dismay, I was unable to locate the airport.

The Tracy airport lies beyond the eastern edge of the add-on scenery. Could installing the San Francisco scenery have erased the Tracy airport from the default scenery?

John Wheeler
Santa Cruz, Calif.

You'll be glad to know that your installation of the San Francisco add-on didn't adversely affect your default scenery. Rather, you've encountered what seems to be an error in the Flight Simulator manual.

We tried locating the Tracy airport after starting from the San Francisco scenery add-on, also without success. We started by choosing the Airports... command from the World menu and then selecting Livermore Municipal Rwy 25R from the list of airports for the San Francisco add-on. We then pressed the [Y] key to



```
N037° 41' 38.1369"   W121° 49' 43.9275"   ALTIT +000400 Ft.
```

FIGURE A
We began our search for the Tracy Airport at Livermore's Runway 7.

activate Slew mode and moved our Cessna to the opposite end of the runway, since taking off from Runway 7 starts us in the right direction, as you can see in **FIGURE A**.

A quick look at the sectional map on page 229 of the FS5 *Pilot's Handbook* revealed that the Tracy airport seems to lie near the 220-degree radial of the nearby Manteca VOR. Measuring the distance between the airport and VOR on the map gave us a figure of 15 millimeters. Since a distance of 10 nautical miles is equal to 12 millimeters on the map, the airport should have been about 12.5 nautical miles from the VOR.

Since the Manteca VOR provides a Distance Measuring Equipment (DME) display, we tried to find the airport by intercepting the 220-degree radial and then flying along it until the DME display read 12.5. But when we got there, there was no airport in sight, as you can see in **FIGURE B**. What was going on? We were well within the default scenery area, so no changes the add-on made should have been in effect here.

We consulted the Airport directory for the San Francisco scenery and could find no reference to the Tracy airport. Armed with this clue, we called Microsoft Technical Support, which confirmed that the Tracy airport was not included in the scenery database after all; the inclusion of its symbol on the map was a printing error.

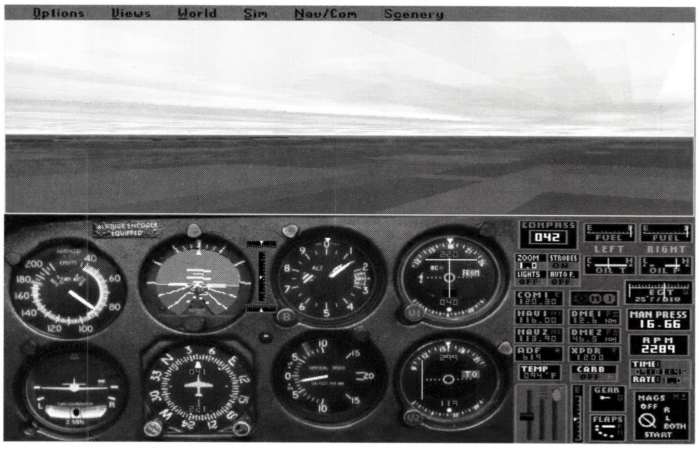


FIGURE B
We're at approximately the right position, but there's no airport here.

However, nearby airports such as Stockton Metropolitan, Modesto and Crow's Landing do appear in the default FS5 San Francisco scenery as indicated in the *Pilot's Handbook*.

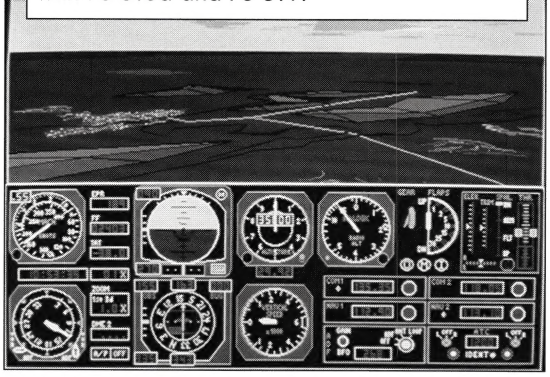
What happened to SubLOGIC?

Full Throttle has lots of information on the Bruce Artwick Organization and on Microsoft. But it has had nothing on SubLOGIC, creators of the USA East and USA West scenery packages for Flight Assignment: ATP and Flight Simulator 4, since the June/July 1994 issue. In the article "A SubLOGICal Arrangement," you described how the USA East and USA West scenery is incompatible with Flight Simulator 5.0a, and you mentioned that SubLOGIC was working on a fix and promised to inform us when a patch was released. I use both FS4—with USA East and USA West—and FS 5.0a, and I want to use USA East and USA West in FS5 if at all possible.

Unless SubLOGIC is out of business, you should have reported on the status of the license agreement (or lack thereof) between BAO and SubLOGIC. If SubLOGIC is no longer in business, you should report this to your subscribers. For some reason, you carefully ignore any news about SubLOGIC. Possibly Microsoft has directed you to do so.

W.J. McKnight
Tyler, Texas

USA East and USA West are comprehensive scenery sets for Flight Assignment: ATP that are compatible with FS4, but incompatible with FS 5.0a and FS 5.1.



Thanks for sharing your concerns with us. Actually, the reason we haven't reported developments with USA East and USA West is simply that there have been no developments to report. Those two scenery sets remain incompatible with Flight Simulator 5.0a and 5.1. We will certainly report any change in this situation in future issues of *Full Throttle*.

As a magazine for pilots of FS5, we spend most of our editorial attention on that program. But we also cover a variety of other simulation programs and topics.

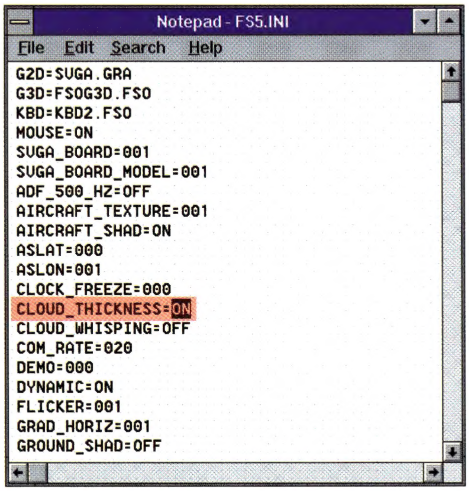
We value feedback from our readers as a way of letting us know what topics you're interested in reading about.

Cloud thickness available in FS 5.0

Today, while trying out the new Europe I scenery from BAO, I happened to open the FS5.INI file. I browsed through it, where I came across an interesting line: CLOUD_THICKNESS=OFF. Instead of the OFF setting, I typed ON, just to see what would happen. When I flew, I noticed that the clouds now actually had different thicknesses, thus enhancing the reality. Obviously the frame rate seemed to drop ever so slightly, and the clouds appeared as blocks, but it does make it more interesting to fly in cloudy conditions, being able to penetrate the clouds horizontally.

Why isn't this feature anywhere in the Setup menu? I've looked, but I can't find it. Thanks, and continue the great work with *Full Throttle*!

Michael Vogt
Wichita, Kan.

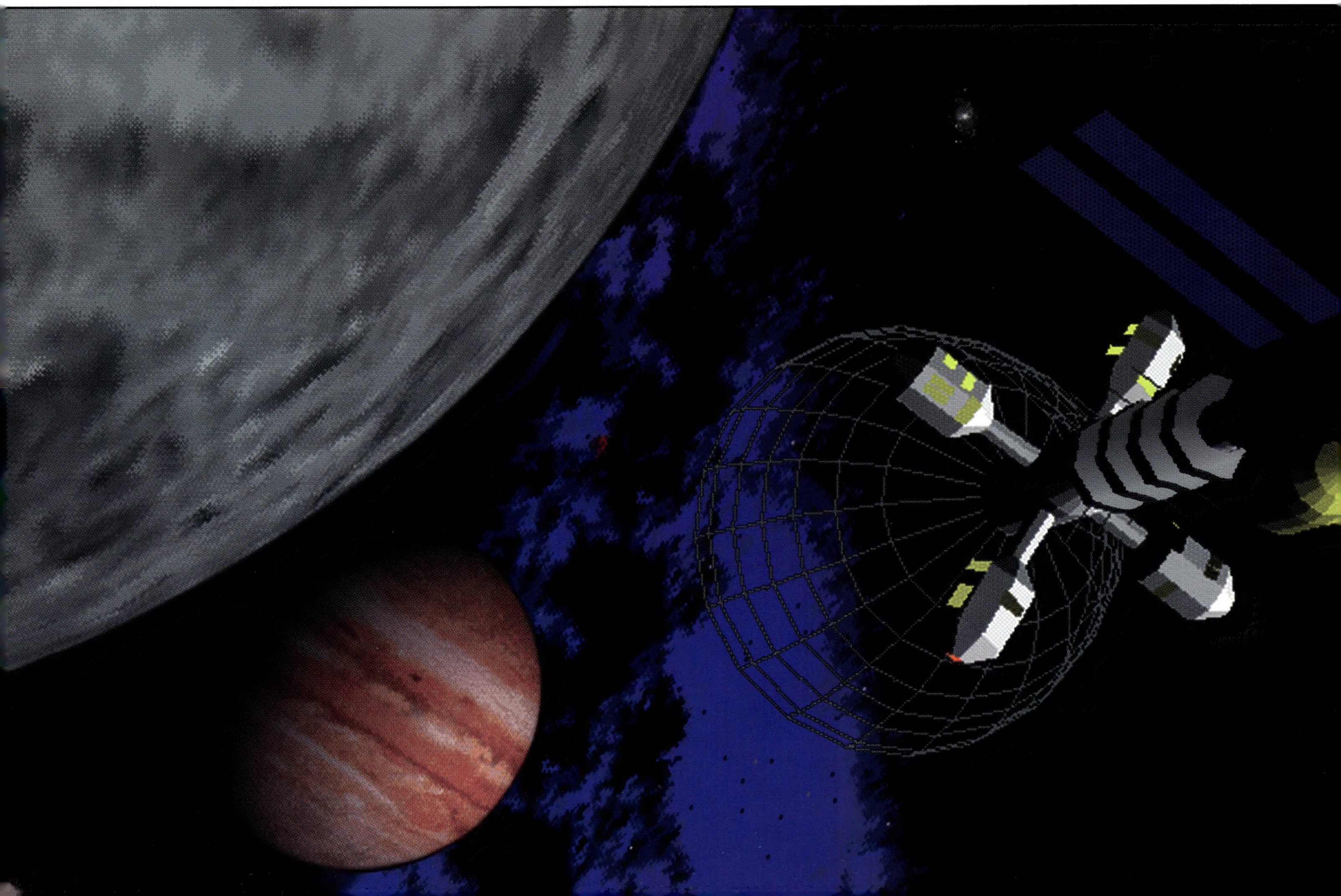


```
G2D=SVGA.GRA
G3D=FSOG3D.FSO
KBD=KBD2.FSO
MOUSE=ON
SVGA_BOARD=001
SVGA_BOARD_MODEL=001
ADF_500_HZ=OFF
AIRCRAFT_TEXTURE=001
AIRCRAFT_SHAD=ON
ASLAT=000
ASLON=001
CLOCK_FREEZE=000
CLOUD_THICKNESS=ON
CLOUD_WHISPING=OFF
COM_RATE=020
DEMO=000
DYNAMIC=ON
FLICKER=001
GRAD_HORIZ=001
GROUND_SHAD=OFF
```

FIGURE A
FS5's initialization file contains this obscure command, which activates three-dimensional cloud formations.

Thanks for the tip, Michael! Using Microsoft Windows' Notepad, we tried editing the FS5.INI file by changing the CLOUD_THICKNESS setting to ON, as you can see in **FIGURE A**. (You could use the DOS 6 Edit program, if you prefer. Either way, if you plan to edit your FS5.INI file, we strongly recommend that you create a backup copy first.) When we saved the file and ran Flight Simulator, clouds did take on a three-dimensional appearance as we approached them, as you can see in **FIGURE B**.

We don't know why a menu command isn't available for this setting in FS5. As you noticed, activating the cloud thickness setting does result in a performance drop. However, since less ground detail is available at higher altitudes, this decrease in performance should be negligible.



The new Flight Simulator version 5.1 does contain a menu toggle for three-dimensional cloud display; furthermore, it allows you to select from among several real-world cloud types. Doing so enters predetermined values for altitude, turbulence and icing into FS 5.1.

(We received a similar letter from Sean O'Grady of Randolph, N.J.)

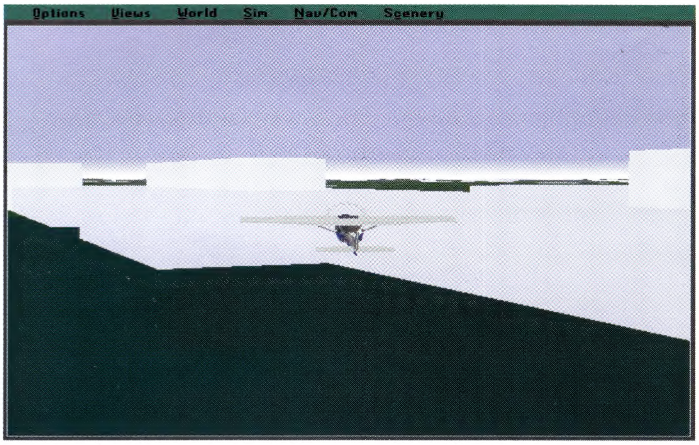


FIGURE B

After you edit the FS5.INI file and save changes, clouds in FS 5.0 and 5.0a appear as three-dimensional shapes when you approach them.

any questions?

If you have a Flight Simulator-related question, please share it with us! We can't guarantee a solution to every problem, but we're eager to give it a shot. If your question is of general interest, we'll print it in this column. You can mail your letters to

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Louisville, KY 40220

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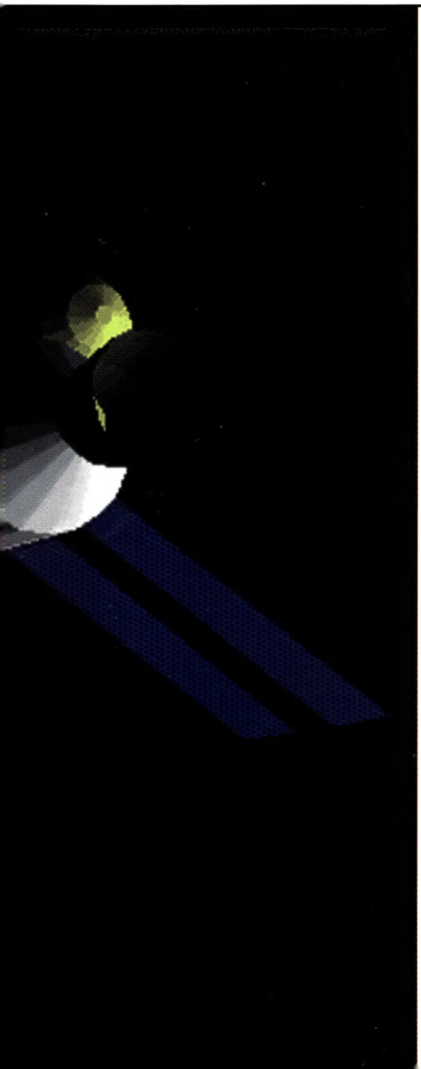

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New Microsoft® Space Simulator is so authentic, even astronauts are asking for it. Select your spacecraft from our fleet and blast off. Once in space, command your ship in our free-flight mode. Explore the fiery red canyons of Mars, or the explosion of a supernova, all based on actual satellite data. It's just one of the realistic simulations we have waiting for you to take control. To get off the ground, shuttle over to your reseller and pick it up.

Microsoft Home

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ThrustMaster releases inexpensive low-end joystick

ThrustMaster, the Portland, Ore., manufacturer of the popular Flight Control System (FCS) joystick for computer flight simulations, recently released an inexpensive controller designed for action and arcade-style computer games.

The XL Action Controller was designed to provide an inexpensive alternative to traditional two-button computer joysticks. It provides a four-way "hat" switch, three action buttons and a fast-action trigger similar to the controls found on the Flight Control System joystick. And like the FCS, the XL Action Controller is fully programmable when used with ThrustMaster's Weapons Control System (WCS) Mark II.

But unlike its more sophisticated flight control cousins, which each carry a price tag close to $200, the XL Action Controller retails for $39.95. This modest price, combined with the joystick's advanced function, sets a new precedent for computer gamers, according to Sales and Marketing Vice President Kevin Darby.

"Since the introduction of the company's first product, ThrustMaster has emerged as the market leader and technological pioneer in high-end interactive controls," Darby said. "ThrustMaster once again leads the way with our introduction into the low-end joystick category by offering true product innovation and value."

The XL Action Controller's interface is supported by top-selling game software such as Interplay's Descent, Dynamix's Earth Siege, LucasArts' Dark Forces and others. The joystick provides a more sophisticated, yet reasonably priced, alternative to controlling games with the keyboard or mouse, Darby said.

"The XL Action Controller serves as an excellent first buy for the game-play enthusiast seeking more control in their favorite games," he said.

The joystick is also compatible with Microsoft Flight Simulator but is not designed to provide the minute control many simulation enthusiasts prefer. The XL Action Controller requires a PC-compatible system and dual-port game card.

XL Action Controller
List price: $39.95

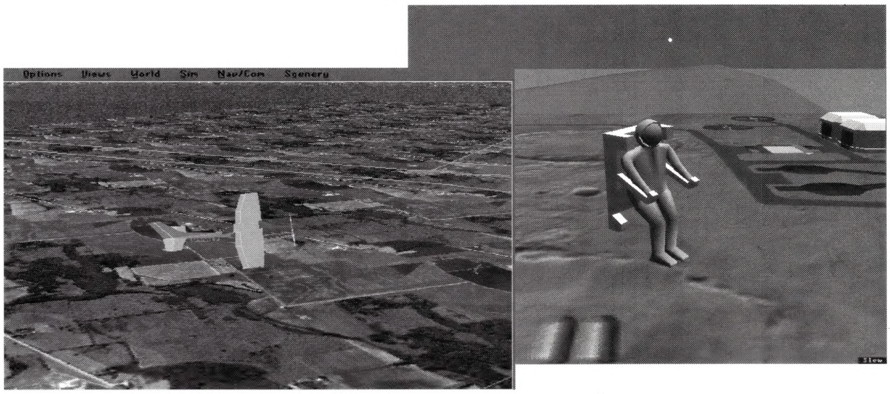
ThrustMaster, Inc.
10150 S.W. Nimbus Avenue
Portland, OR 97223-4337
Phone: (503) 639-3200
Fax: (503) 620-8094

Microsoft forms simulation group to increase focus on development

Microsoft Corp. recently reorganized its staff to bring greater development, support and marketing resources to several elements of its popular Microsoft Home line of entertainment software, which includes Flight Simulator 5.

The reorganization has created a team that's devoted solely to marketing and supporting Flight Simulator and Space Simulator, both of which are designed by the Bruce Artwick Organization, according to Jon Solon, who currently heads simulation development.

"The reorganization of our group will bring stronger focus to the products we're building," Solon said. "There's a real renewed



Microsoft's recent reorganization of its entertainment software group will mean greater resources devoted to the support and development of programs such as Flight Simulator and Space Simulator.

focus in that Microsoft has devoted the most resources ever to these products."

Leigh Kole, lead product manager for the team, said the new structure reflects the commitment of the both the company and its customers.

"It's really exciting for us to reflect how commited we are to these products," Kole said. "It's directly a result of the loyalty of the following we have."

The popularity of Microsoft's entertainment software created an explosion of products that the company felt warranted specialized development, marketing and support teams, Solon said.

"Basically, our entertainment group here at Microsoft has grown at such a rapid pace with so many products that it didn't make much sense to keep the existing structure," he said.

Microsoft created three teams from its entertainment software group in early March. One handles the company's sports games, such as Microsoft Baseball; one develops action and adventure software, such as Microsoft Arcade; and the third is devoted solely to simulations.

Separate grouping means each team will enjoy the services of its own development, marketing and support personnel, instead of having to share them. Solon said he anticipated a number of new hires to take place soon and estimated that a team devoted solely to simulations could cut by one-third the amount of time needed to develop new products.

Looking Glass releases new simulator on CD-ROM

Looking Glass Technologies, a Cambridge, Mass., software company, will soon release a highly realistic flight simulator on CD-ROM that uses unique technology to duplicate aerobatic flight.

Flight Unlimited uses newly designed graphics processes and real-world physics modeling to create a realistic flight experience. The flight model simulates air flowing over a geometric model of the aircraft, bringing the realism of a computerized wind tunnel to desktop PCs. By modeling the airflow around the entire plane, the program can simulate turbulence, winds and changing atmospheric conditions.

A unique texture-mapping process based on aerial photographs provides a realistic scenery backdrop at any angle or altitude. The CD-ROM is packed with scenery for areas such as Sedona, Az., and Aspen, Colo.

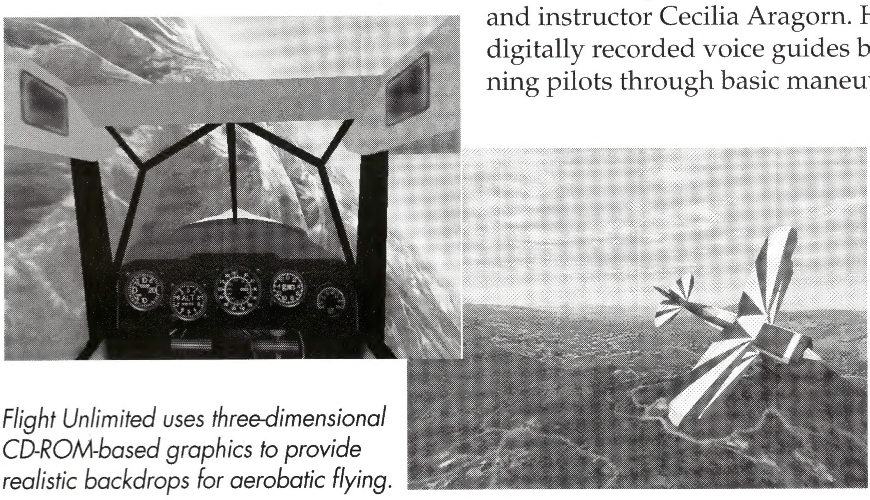
Flight Unlimited comes with six high-performance aircraft models, including the Pitts S-2A biplane, the Bellanca Decathalon and the Russian-designed Sukhoi SU-31. Pilots can also take a break from powered flight and soar in the Grob S103 sailplane.

Besides free flight, the program supplies a challenging computer-generated obstacle course that lends a competitive element to the program. In addition, the Flight Unlimited CD-ROM includes 25 flight lessons by the internationally known aerobatics pilot and instructor Cecilia Aragorn. Her digitally recorded voice guides beginning pilots through basic maneuvers and describes how to perform stunts such as hammerhead stalls and the Immelman turn.

Throughout the flight session, pilots can enjoy the view from up to five individually controllable flight cameras, while digitally recorded engine and wind noises contribute to the realism. A record feature lets pilots play back particularly daring stunts or create an aerial tour of the scenery.

Besides supporting a variety of graphics cards and sound boards, Flight Unlimited is designed to be used with several virtual reality headsets that let pilots change their perspective simply by turning their heads.

Looking Glass Technologies' designers have also created such popular programs as Chuck Yeager's Advanced Flight Trainer, Ultima Underworld, System Shock and Links Pro.


Flight Unlimited uses three-dimensional CD-ROM-based graphics to provide realistic backdrops for aerobatic flying.

Flight Unlimited
List price: $79.95

Looking Glass Technologies
One Alewife Center, Suite 450
Cambridge, MA 02140
Phone: (617) 441-6333
Fax: (617) 441-3946

Microsoft releases FS 5.1

The newest version of Flight Simulator, which according to Microsoft Corp. has created a stir of excitement among its beta testers, will be available on store shelves by the middle of June.

The new version, Flight Simulator 5.1, resembles in many ways the original FS 5.0, which was released in late 1993, but FS 5.1 contains a vast number of improvements and additional features, according to Leigh Kole, lead product manager for Microsoft's simulation marketing team.

"It's very exciting for us that we can provide yet another revolutionary release in a very short time frame," Kole said. "We're thrilled to provide such a substantial upgrade."

Among the improvements the new release incorporates are new 256-color scenery textures, more realistic weather and visibility controls, a series of predesigned flight challenges and an improved method for handling add-on scenery. Many of FS 5.1's new features generated a great deal of excitement among computer pilots who tested the beta, or preliminary, versions of the upgrade, Kole said.

"We consider this a 'must' upgrade and our beta testers seem to feel the same way," she said. "We've been gratified that the response from beta testers has been phenomenal."

FS 5.1 is available on three floppy disks or on CD-ROM, which also contains a large amount of additional scenery. Kole said that people who install the CD-ROM version will immediately notice the extra material. "It's clear we have really packed in a lot of additional content (with the CD-ROM)," she said.

Kole said that she plans to post a list of FS 5.1's top new features on CompuServe's Flight Simulation forum (GO FSFORUM). She also emphasized that FS 5.1 provides seamless compatibility with all previously released FS5 scenery.

For a review of FS 5.1, see the article "Version 5.1 Expands the Flight Simulator World," in the April/May issue of *Full Throttle.*

Microsoft Flight Simulator 5.1

List price: $49.95 (floppy disk)
$59.95 (CD-ROM)
($10 rebate available for previous Flight Simulator owners)

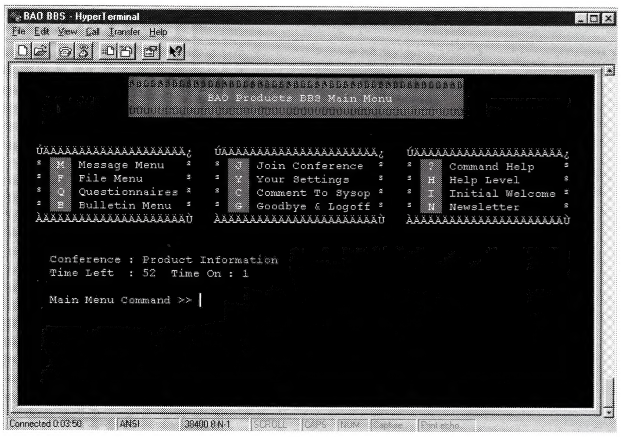
Microsoft Sales

Phone (800) 426-9400
or (206) 936-8661

BAO offers support via BBS

Computer pilots with questions about Flight Simulator 5 can get answers by calling a bulletin board system (BBS) maintained by The Bruce Artwick Organization, the designers of FS5.

The BBS contains patch files, screen shots of upcoming products and a discussion forum where members can exchange questions and information about BAO products.



```
BAO BBS - HyperTerminal
File  Edit  View  Call  Transfer  Help

                     BAO Products BBS Main Menu

ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿  ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿  ÚÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ¿
³ M  Message Menu    ³  ³ J  Join Conference  ³  ³ ?  Command Help    ³
³ F  File Menu       ³  ³ Y  Your Settings    ³  ³ H  Help Level      ³
³ Q  Questionnaires  ³  ³ C  Comment To Sysop ³  ³ I  Initial Welcome ³
³ B  Bulletin Menu   ³  ³ G  Goodbye & Logoff ³  ³ N  Newsletter      ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ  ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ  ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ

  Conference : Product Information
  Time Left  : 52   Time On : 1

  Main Menu Command >> |

Connected 0:03:50   ANSI   38400 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo
```

BAO's bulletin board supports Flight Simulator 4 and 5.

Don Orr, the BBS's system operator (sysop), said the bulletin board is a good resource for computer pilots who have a modem but aren't members of an online service such as CompuServe or America Online.

"It's provided as a service to our customers. We use it to support and provide information on product releases," Orr said.

The bulletin board, which is online 24 hours a day, seven days a week, contains a variety of files, such as screen shots of upcoming BAO releases, patches for scenery files and FS5-related shareware. There's no membership fee for the BBS; callers pay only long-distance charges while online.

Conference areas on the bulletin board host questions about FS4 and FS5, scenery add-ons and upcoming products. Orr said much of his time is spent responding to questions from users.

"We get inquiries about coming products and we get questions about our add-ons, particularly now that Las Vegas and Europe have been released," he said. "Either I'll answer them or I'll get answers for them and post them on the bulletin board."

The BBS also features a file section supporting Flight Simulator 4. This file area contains graphics drivers, aircraft and scenery files.

Orr said users are also welcome to upload files, which he checks and then posts for other users to download. However, he said, the BAO BBS does not accept or offer shareware scenery files at this time.

"The shareware scenery files are generating database errors because they conflict with the commercially available scenery," he said.

BAO BBS

BBS: (217) 356-3492

A V-speed chart for your Cessna 182

One of the first things a student pilot learns about his or her aircraft is a set of airspeed limitations—speeds at which the performance of the plane conforms to a predictable standard. These airspeeds are collectively known as *V-speeds* because they're represented by the letter V, which is short for velocity.

The pilot's operating handbook for a given aircraft model will contain a list of V-speeds that the pilot should memorize. For example, two crucial V-speeds are known as V_{so}, the stall speed with the flaps extended or minimum airspeed at which the aircraft is controllable, and V_x, the airspeed at which the aircraft has the best angle of climb or the speed at which you'll clear obstacles at the end of the runway the fastest.

We consulted the documentation for the Cessna 182 RG to provide you with this list of V-speeds for that aircraft. Several of these speeds are marked on a standard airspeed indicator. For example, V_{ne}—the never-exceed speed—is marked as a red line. The green arc represents the plane's normal operating range, while the white arc represents the range of speeds at which you can safely operate an aircraft with its flaps down. Let's define some of the most important V-speeds.

V_r	Rotation speed. Speed at which the pilot should lift the nosewheel during the takeoff roll.
V_x	Best angle of climb. The most altitude gained per distance traveled. Important for short-field takeoff or to clear an obstacle.
V_y	Best rate of climb. Speed to gain the most altitude in a given period of time.
V_{so}	Stall speed with flaps extended. Marked as the bottom of the white arc on a standard airspeed indicator.
V_s	Stall speed in the clean configuration (flaps up). Marked as the bottom of the green arc.
V_a	Maneuvering speed. The maximum airspeed for rough air or at which maneuvers should be attempted.
V_{fe}	Maximum speed at which flaps may be extended. Marked as the top of the white arc.
V_{lo}	Maximum operating speed with the landing gear extended.
V_{no}	Maximum structural cruise. The fastest speed allowable for normal operations. Marked as the upper limit of the green arc.
V_{ne}	Never-exceed airspeed. The maximum speed at which the aircraft can be operated in smooth air. Marked as a red arc or line. This speed is fairly self-explanatory—a pilot should never exceed this speed intentionally.

V-speeds for the Cessna 182 RG

V_{so}	(Stall speed, flaps extended)	39 knots
V_s	(Stall speed, clean)	41 knots
V_r	(Rotation speed)	50 knots
V_x	(Best angle of climb)	65 knots
V_y	(Best rate of climb)	88 knots
V_a	(Maneuvering speed)	112 knots
V_{fe}	(Max speed, flaps extended)	95 knots
V_{lo}	(Max operating speed, gear extended)	95 knots
V_{no}	(Max structural cruise)	158 knots
V_{ne}	(Never exceed)	181 knots
Best rate of glide (clean)		73 knots

NOT FOR REAL-WORLD FLYING

Join the online flight line

Flight Simulator 5 lets users discover the wonders of flight from their computers. And just as a network of airports and FBOs (Fixed Base Operators, or flight service facilities) serves the needs of real-world pilots, a number of online services now provide support and files for FS5 pilots with access to a modem.

Such services can range from a small bulletin board system (BBS) run as a labor of love by a simulation enthusiast to a special-interest forum on one of the giant commercial systems. Two popular commercial online services, CompuServe Information Service and America Online, maintain forums for pilots of FS5 and other simulators.

We'll examine how computer pilots with access to a modem can gain access to advice, discussion, shareware and freeware for FS5 24 hours a day through CompuServe and AOL. We'll also preview the many files and discussion forums available online. In future issues, we'll continue to explore major online systems and BBSs devoted to flight simulation.

the way to the forum

If you have a CompuServe account, you already know that the service provides powerful resources for exchanging electronic mail, shopping by computer and checking on the latest news, weather and stock quotes. But you might not know that CIS maintains a popular flight simulation forum where computer pilots exchange advice, information, shareware scenery and utility files.

If you aren't a CompuServe member, you can obtain a membership kit by calling a customer service number toll-free and telling the customer service representative you're a PC user. You'll get a membership kit that includes a copy of the DOS or Windows version of the CompuServe Information Manager, a program that simplifies connecting to and using the service. If you're a member but don't have the program, you can download a copy by accessing its file area (GO CIMSOFT).

We'll use the Windows version of the CompuServe Information Manager (WinCIM), shown in **FIGURE A**, to explore the service. Run the program and make sure your connection information is correct. Then, choose Connect... from the File menu; when you do, you'll see the Connect To CompuServe dialog box shown in **FIGURE B**. Click on the large Connect button that has the keyboard graphic to establish your connection to CompuServe.

Once you're online, click the button bar icon that looks like a traffic light (🚦). You'll see the Go dialog box; type *FSFORUM* into the text box and then click OK. The program sends the command GO FSFORUM to CompuServe. If this is your first visit to the Flight Simulation Forum, you'll see a dialog box asking if you want to "join"—or enter—the forum (you're charged extra for the time you spend in many CompuServe forums, including this one). Once you agree to join the forum, you'll see a screen like the one in **FIGURE C**.

The News Flash dialog box appears the first time you join the Flight Simulation Forum in a given CIS session. It describes new files and upcoming events. The group of icons on the right side of the screen is your key to accessing the forum's many files and discussion groups. Clear the News Flash dialog box, and let's do a little exploring.

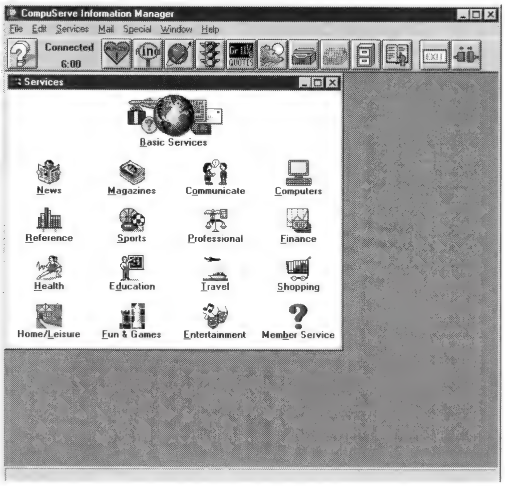


FIGURE A

WinCIM provides an icon-oriented graphical interface for CompuServe.

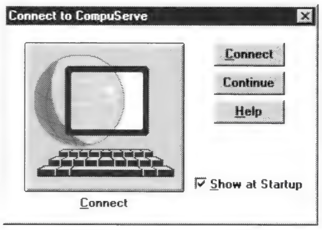
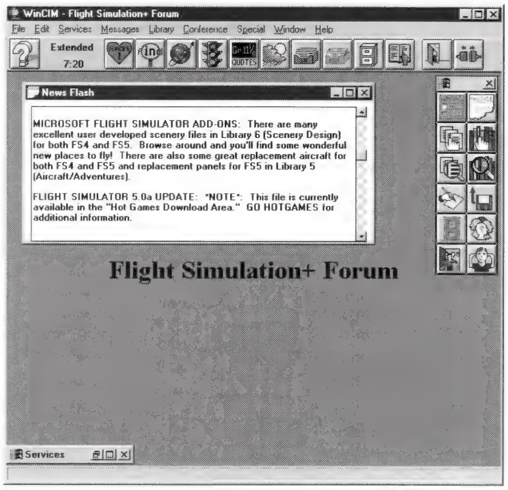


FIGURE B

You connect to CompuServe simply by clicking the large button that has the keyboard graphic.

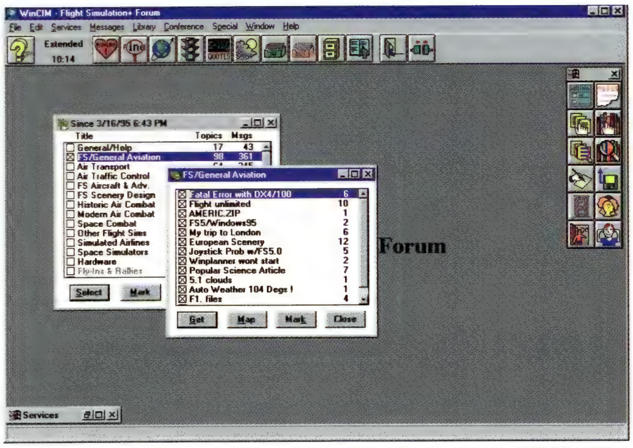

WinCIM - Flight Simulation+ Forum
File Edit Services Messages Library Conference Special Window Help
Extended
7:20
News Flash
Flight Simulation+ Forum
Services

MICROSOFT FLIGHT SIMULATOR ADD-ONS: There are many excellent user developed scenery files in Library 6 (Scenery Design) for both FS4 and FS5. Browse around and you'll find some wonderful new places to fly! There are also some great replacement aircraft for both FS4 and FS5 and replacement panels for FS5 in Library 5 (Aircraft/Adventures).

FLIGHT SIMULATOR 5.0a UPDATE: *NOTE*: This file is currently available in the "Hot Games Download Area." GO HOTGAMES for additional information.

FIGURE C

You'll see the latest news when you initiate a Flight Simulation Forum session.


WinCIM - Flight Simulation+ Forum
File Edit Services Messages Library Conference Special Window Help
Extended
10:14
QUOTES
Forum
Services

Since 3/16/95 6:43 PM

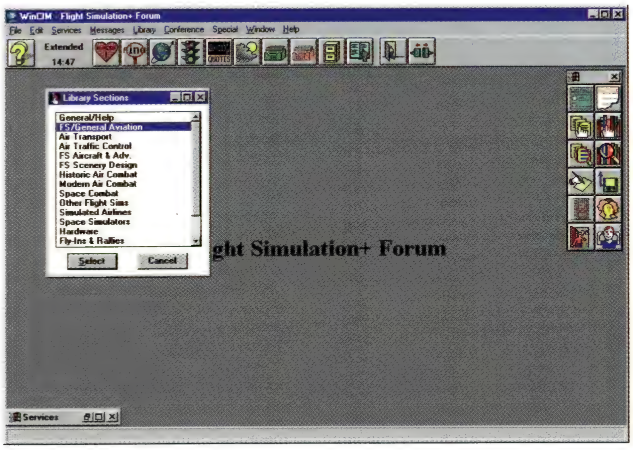
	Title	Topics	Msgs
☐	General/Help	17	43
☒	FS/General Aviation	98	361
☐	Air Transport		
☐	Air Traffic Control		
☐	FS Aircraft & Adv.		
☐	FS Scenery Design		
☐	Historic Air Combat		
☐	Modern Air Combat		
☐	Space Combat		
☐	Other Flight Sims		
☐	Simulated Airlines		
☐	Space Simulators		
☐	Hardware		
☐	Fly-Ins & Rallies		

FS/General Aviation

☒	Fatal Error with DX4/100	6
☒	Flight unlimited	10
☒	AMERIC.ZIP	1
☒	FS5/Windows95	2
☒	My trip to London	6
☒	European Scenery	12
☒	Joystick Prob w/FS5.0	5
☒	Winplanner wont start	2
☒	Popular Science Article	7
☒	5.1 clouds	1
☒	Auto Weather 104 Degs !	1
☒	F1. files	4

FIGURE D

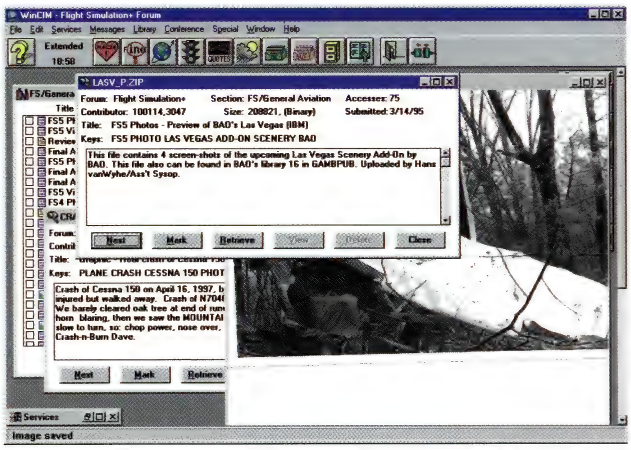
Computer pilots exchange tips, rumors and opinions in the message area.


WinCIM - Flight Simulation+ Forum
File Edit Services Messages Library Conference Special Window Help
Extended
14:47
QUOTES
Library Sections
ght Simulation+ Forum
Select
Cancel
Services

General/Help
FS/General Aviation
Air Transport
Air Traffic Control
FS Aircraft & Adv.
FS Scenery Design
Historic Air Combat
Modern Air Combat
Space Combat
Other Flight Sims
Simulated Airlines
Space Simulators
Hardware
Fly-Ins & Rallies

FIGURE E

The FS/General Aviation library contains FS5-related files.


WinCIM - Flight Simulation+ Forum
File Edit Services Messages Library Conference Special Window Help
Extended
10:50
QUOTES
LASV_P.ZIP
Next
Mark
Retrieve
View
Delete
Close
Services
Image saved

Forum: Flight Simulation+ Section: FS/General Aviation Accesses: 75
Contributor: 100114,3047 Size: 208821, (Binary) Submitted: 3/14/95
Title: FS5 Photos - Preview of BAO's Las Vegas (IBM)
Keys: FS5 PHOTO LAS VEGAS ADD-ON SCENERY BAO

This file contains 4 screen-shots of the upcoming Las Vegas Scenery Add-On by BAO. This file also can be found in BAO's library 16 in GAMBPUB. Uploaded by Hans vanWyhe/Ass't Sysop.

Keys: PLANE CRASH CESSNA 150 PHOT

Crash of Cessna 150 on April 16, 1997, b
injured but walked away. Crash of N704
We barely cleared oak tree at end of run
horn blaring, then we saw the MOUNTAI
slow to turn, so: chop power, nose over,
Crash-n-Burn Dave.

FIGURE F

You can browse many types of files, including graphics and shareware scenery.

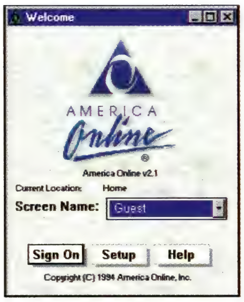
First, let's browse through the messages on the forum. Click the icon that looks like a finger pointing to sheets of paper (▣). A dialog box containing a list of subjects will appear; double-click the FS/General Aviation topic. You'll then see a dialog box containing a list of message titles, as shown in **FIGURE D**. The number to the right indicates the number of messages under a given heading; sometimes a lively discussion results in a *message thread*, or series of messages, containing dozens of responses by many different users.

Go ahead and browse through the titles until you see one that interests you. You might discover a message about a problem you've been having with FS5 or a discussion of a scenery add-on you've considered buying.

If you want, you can even post a message. Choose Create Message... from the Messages menu. In the resulting dialog box, type *New Member* in the Subject dialog box. We'll send this message to Rick Lee, one of the forum's system operators, or *sysops*. In the To text box, type the sysop's name, *Rick Lee*, and his ID number, which is *76702,1707*. In the Message text box, write a short note introducing yourself and describing your flight simulation and CompuServe experience level. In a subsequent session, don't be surprised if you find a message from the sysop welcoming you to the forum.

Now let's browse through the many Flight Simulator-related files that this forum contains. In the button bar on the right-hand side of your screen, click the Library button—it looks like a finger pointing to a shelf of books (▣).

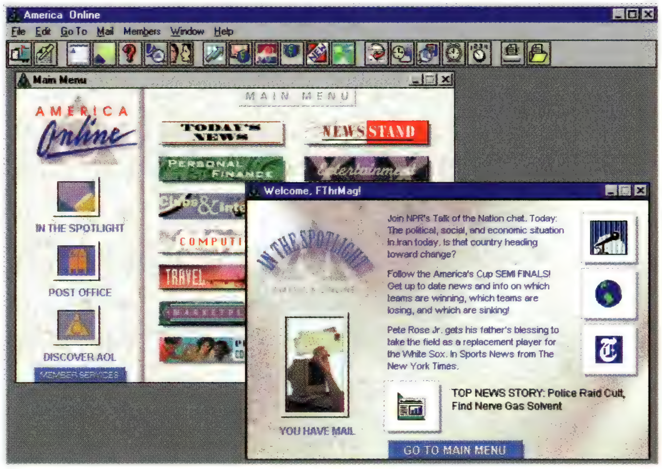
Again, you'll see a dialog box listing subject areas. Choose the FS/General Aviation area, as shown in **FIGURE E**, and browse the list of titles. You can highlight one of the files and click the Description button for more details. You can click Retrieve to download a file immediately or click Mark to flag the file for later retrieval. You can even view graphics files online. **FIGURE F** shows several



Current Location: Home
Screen Name: Guest
Copyright (C) 1994 America Online, Inc.

FIGURE G

You connect to America Online through this dialog box.



Join NPR's Talk of the Nation chat. Today: The political, social, and economic situation in Iran today. Is that country heading toward change?

Follow the America's Cup SEMI FINALS! Get up to date news and info on which teams are winning, which teams are losing, and which are sinking!

Pete Rose Jr. gets his father's blessing to take the field as a replacement player for the White Sox. In Sports News from The New York Times.

TOP NEWS STORY: Police Raid Cult, Find Nerve Gas Solvent

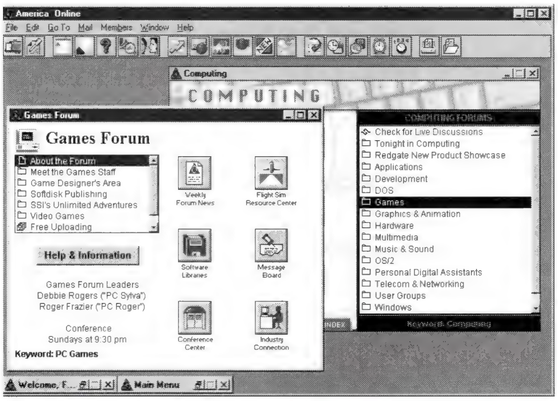
FIGURE H

Colorful welcome screens greet you when you log onto AOL.

examples from the Flight Simulation Forum's General Aviation Library. Other libraries to check include the FS Scenery Design and FS Aircraft & Adv. (which is short for Adventures).

You can also click the Search icon (🔍) to search the forum for files by keyword. Good keywords to try are FS5, SCENERY, ADD-ON, PHOTO and AIRCRAFT. Bear in mind that you'll see files that match any of the keywords you use, so if you search on the keyword AIRCRAFT, you'll see a number of planes for Flight Simulator 4.

Among the unique features an online service such as CompuServe offers are the several virtual airlines, which let computer pilots fly regular routes through the simulated scenery, ferrying virtual passengers while keeping up with a predetermined schedule. For more information on this unique simulation topic, see the sidebar "Fly the Virtual Skies of Online Airlines," on page 15.



Games Forum

- About the Forum
- Meet the Games Staff
- Game Designer's Area
- Softdisk Publishing
- SSI's Unlimited Adventures
- Video Games
- Free Uploading

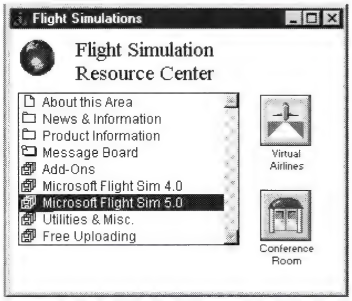
Games Forum Leaders
Debbie Rogers ("PC Sylva")
Roger Frazier ("PC Roger")

Conference
Sundays at 9:30 pm

Keyword: PC Games

- Check for Live Discussions
- Tonight in Computing
- Redgate New Product Showcase
- Applications
- Development
- DOS
- Games
- Graphics & Animation
- Hardware
- Multimedia
- Music & Sound
- OS/2
- Personal Digital Assistants
- Telecom & Networking
- User Groups
- Windows

FIGURE I
The Games forum in the Computing area contains a special flight simulation section.



Flight Simulation Resource Center

- About this Area
- News & Information
- Product Information
- Message Board
- Add-Ons
- Microsoft Flight Sim 4.0
- Microsoft Flight Sim 5.0
- Utilities & Misc.
- Free Uploading

FIGURE J
The Flight Simulation Resource Center supports many types of simulators.

go online

America Online shares many convenient features with CompuServe, including 24-hour access and a Windows interface. It also maintains a flight simulation forum where computer pilots can find files and advice.

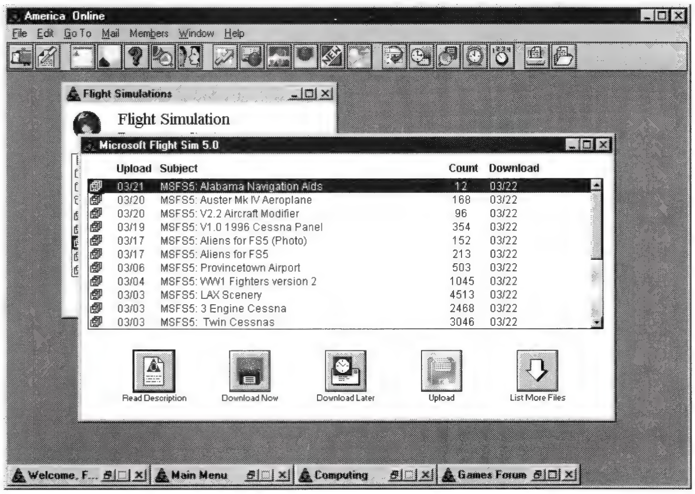
If you aren't an America Online member, you can order a startup kit by calling (800) 827-6364. New members can try out AOL with 10 hours of free connect time.

To get started with America Online, launch the AOL graphical interface. You'll see a dialog box like the one in **FIGURE G** on page 13. Click Sign On and enter your user name and password, if necessary. You'll see the welcome screen shown in **FIGURE H**, also on page 13. Notice that AOL's interface also contains a toolbar for major tasks such as searching for files or composing electronic mail. Clear the welcome screen and then choose Computing from the main menu. The resulting screen will include a list of forums in the right-hand column; choose Games and then click the Flight Sim Resource Center button shown in **FIGURE I**.

You've now arrived at AOL's forum for computer pilots. As you can see from the dialog box shown in **FIGURE J**, the Flight Simulation Resource Center features a software library dedicated to FS5, as well as news, product information and message areas, plus a special area for virtual airlines.

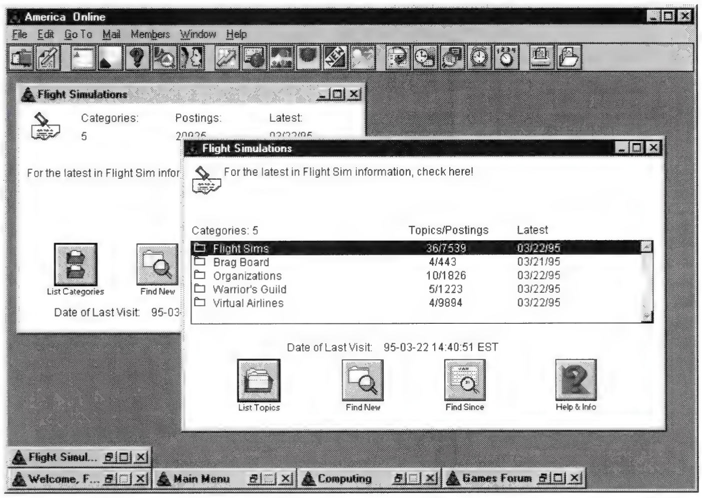
Choosing the FS5 file area invokes a dialog box like the one shown in **FIGURE K**. As you can see, you can choose from a number of text, scenery and modified airplane files. Clicking the Read Description button calls up sum-

(Continued on page 25)



Upload	Subject	Count	Download
03/21	MSFS5: Alabama Navigation Aids	12	03/22
03/20	MSFS5: Auster Mk IV Aeroplane	168	03/22
03/20	MSFS5: V2.2 Aircraft Modifier	96	03/22
03/19	MSFS5: V1.0 1996 Cessna Panel	354	03/22
03/17	MSFS5: Aliens for FS5 (Photo)	152	03/22
03/17	MSFS5: Aliens for FS5	213	03/22
03/06	MSFS5: Provincetown Airport	503	03/22
03/04	MSFS5: WW1 Fighters version 2	1045	03/22
03/03	MSFS5: LAX Scenery	4513	03/22
03/03	MSFS5: 3 Engine Cessna	2468	03/22
03/03	MSFS5: Twin Cessnas	3046	03/22

FIGURE K
AOL's flight simulation area features many FS5-related files.



Categories: 5
Postings: 20825
Latest: 03/22/95

For the latest in Flight Sim infor

Date of Last Visit: 95-03

For the latest in Flight Sim information, check here!

Categories: 5	Topics/Postings	Latest
Flight Sims	36/7539	03/22/95
Brag Board	4/443	03/21/95
Organizations	10/1826	03/22/95
Warrior's Guild	5/1223	03/22/95
Virtual Airlines	4/9894	03/22/95

Date of Last Visit: 95-03-22 14:40:51 EST

FIGURE L
You can read or post messages about commercial aviation or combat-oriented simulators.

Fly the virtual skies of online airlines

Online computer services have a lot to offer computer pilots—including virtual employment with a simulated airline. The pilots fly regular routes, report their performance to the airline's managers and gain promotions based on experience, just like their real-world counterparts. Just about the only thing not simulated is a virtual paycheck.

CompuServe and America Online both host several virtual airlines. On CompuServe, Assistant Sysop Mike Thompson oversees the Flight Simulation Forum's virtual airline message board and file library. You can see part of the simulated airline message section in **FIGURE A**.

Virtual airlines provide realistic flight simulation because they adhere to real-world commercial aviation procedures, Thompson said in a telephone interview from his Jacksonville, Fla., home.

Several airlines maintain routes in Flight Simulator 4 and 5, including Alta Loma Airlines, Noble Air, American East Airlines, MidContinent and North American Executive.

Pilots interested in information about a simulated airline should search on the keywords SIMULATED AIRLINES in Library 11 of CompuServe's Flight Simulation Forum (GO FSFORUM). The library contains several introductory operations manuals; in general, new pilots should send electronic mail to the person who uploaded the manual.

"Depending on the airline, they may have to take a checkride," Thompson said. "Other airlines just give you a route and tell you to report in. Some airlines are more aggressive—some will shoot them back a message saying, 'Hey, you're hired, fly this line.'"

Virtual airline pilots check the online service for their schedule, fly the route at home and then post a report of the flight results, including elapsed time. Routes could include a short commuter hop between Boston's Logan Airport and JFK International in New York or a long haul from Chicago to Los Angeles.

New members are given simpler and easier routes to fly. These routes often use FS5's default scenery; others expand the airline's service to cities in add-on scenery.

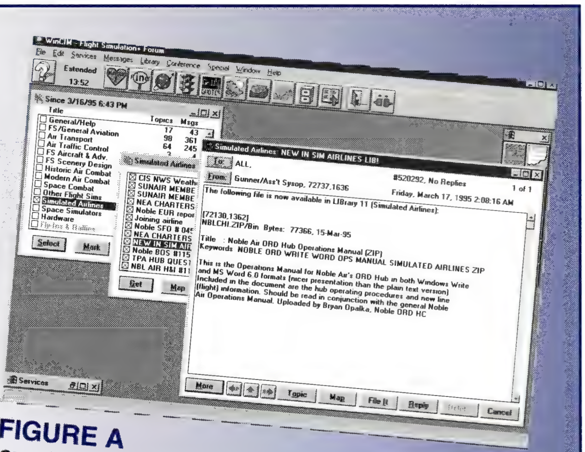
And unlike real-world airline pilots, members of a virtual airline can log thousands of hours without ever leaving home. "It's really as much or as little as they want to do or have time to do," Thompson said.

Simulated airlines often post FS4-compatible aircraft that sport the airline's distinctive paint scheme. Thompson noted that Alta Loma Airlines in particular has repainted aircraft, ticket counters and passenger gates featuring the Alta Loma logo. "They've got some absolutely stunning graphics files," he said.

Thompson predicted that the impending release of the Flight Shop aircraft editor for FS5 will result in an expansion of the simulated airline's FS5 fleet, with repainted Cessnas, Learjets and larger passenger jets appearing. The availability of new aircraft, from prop-driven twins like the Fairchild Merlin to heavy iron like the Airbus A340, should also lure FS5 pilots to simulated airlines in increasing numbers, Thompson said.

"We'll see an explosion of interest and participation," he said. "It's easy to get tired of flying that Learjet."

One scenery area that has enjoyed increasing attention from virtual airlines is the Microsoft Caribbean add-on scenery. Its popularity is due in part to the large number of airports within range of the smaller aircraft currently available in FS5. In fact, the simulated airline North American Executive has even posted an edited FS5 screen capture, shown in **FIGURE B**, advertising its available Caribbean routes, just as a real-world airline might attempt to recruit new pilots.



Title	Topics	Msgs
☐ General/Help		
☐ FS/General Aviation	17	43
☐ Air Transport	98	361
☐ Air Traffic Control	64	245
☐ FS Aircraft & Adv.	3	4
☐ FS Scenery Design		
☐ Historic Air Combat		
☐ Modern Air Combat		
☐ Space Combat		
☐ Other Flight Sims		
☒ Simulated Airlines		
☐ Space Simulators		
☐ Hardware		
☐ Fly-Ins & Rallies		

- ☒ CIS NWS Weath
- ☒ SUNAIR MEMBE
- ☒ SUNAIR MEMBE
- ☒ NEA CHARTERS
- ☒ Noble EUR repor
- ☒ Joining airline
- ☒ Noble SFO # 045
- ☒ NEA CHARTERS
- ☒ NEW IN SIM AIR
- ☒ Noble BOS #115
- ☒ TPA HUB QUEST
- ☒ NBL AIR H&I #11

Simulated Airlines: NEW IN SIM AIRLINES LIB!

To: ALL,

From: Gunner/Ass't Sysop, 72737,1636

#520292, No Replies

1 of 1

Friday, March 17, 1995 2:08:16 AM

The following file is now available in LIBrary 11 (Simulated Airlines):

[72130,1362]
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Title : Noble Air ORD Hub Operations Manual (ZIP)
Keywords NOBLE ORD WRITE WORD OPS MANUAL SIMULATED AIRLINES ZIP

This is the Operations Manual for Noble Air's ORD Hub in both Windows Write and MS Word 6.0 formats (nicer presentation than the plain text version) Included in the document are the hub operating procedures and new line (flight) information. Should be read in conjunction with the general Noble Air Operations Manual. Uploaded by Bryan Opalka, Noble ORD HC

FIGURE A
Simulated airlines post operations manuals and messages in CompuServe's Flight Simulation Forum.

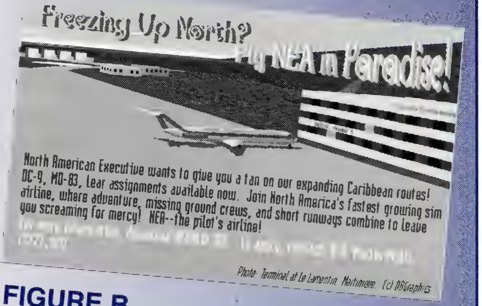

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Photo: Terminal at Le Lamentin, Martinique. (c) DBGraphics

FIGURE B
Simulated airlines can provide "repainted" aircraft and scenery to their pilots; some even advertise for new recruits.

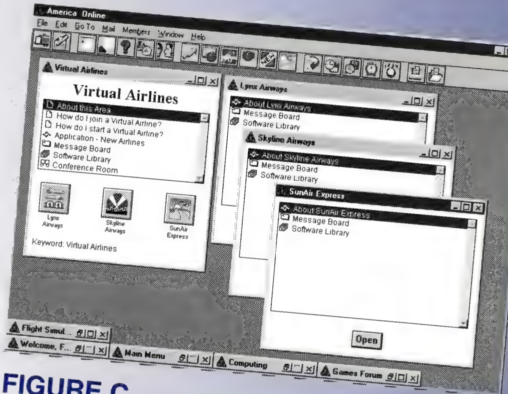


FIGURE C
America Online also hosts several simulated airlines, including some not found on CompuServe.

One of the most exacting simulated airlines is SunAir, a line for SubLOGIC's Flight Assignment: ATP, a commercial airline simulator. SunAir maintains hubs and assigns its most experienced pilots to choice routes just as real-world airlines do. It can be found on both CompuServe and America Online.

SunAir staff members examine computerized pilot logs to determine the profit or loss from a given air route. SunAir maintains a presence on America Online in the Virtual Airline section of AOL's Flight Simulator Resource Center. AOL also hosts two airlines not found on CompuServe—Lynx Airways and Skyline Airways—as you can see in **FIGURE C**.

CROSS COUNTRY *by Alfred Poor*

A (Puget) sound plan

There's an old folk song about Puget Sound, with a final refrain that goes "surrounded by acres of clams." If you're a fan of fresh seafood, from salmon to shellfish, then you'll want to head on out to the Pacific Northwest for a visit.

This is the tenth "Cross Country" installment in *Full Throttle*, and the Seattle scenery area is the one remaining U.S. area that we haven't visited twice. This flight will round out our second circuit of the default Flight Simulator 5 scenery. As always, we'll give you a place to go and a complete flight plan to get there, following all the real-world FAA rules and regulations as best we can in the process.

When we visited this area last time, the planned flight was a local round-trip starting and ending at Olympia Airport ("Airport Hopscotch," in the August/September 1994 issue). This time, you'll be taking a scenic tour of Puget Sound, flying up to Harvey Field in Snohomish County, Washington. You can camp right on the field and then take the short trip to nearby Everett for a tour of the Boeing aircraft factory.

planning a route

When we flew through L.A. in last issue's trip, we used a combination of radio navigation, ded reckoning, and pilotage ("Wedding Cake Blues," April/May 1995). This time, you can turn off the navigation radios because you'll be relying solely on your DG (directional gyroscope) and your Mark I Eyeball to find your way. In the process, you'll get an up-close-and-personal tour of Puget Sound.

How close? Well, the Seattle area isn't known for its sunshine or arid climate. For this flight, we've set you up with a solid overcast to fly under—there's still plenty of room for safe VFR flight, but don't let your altitude drift away from you or you'll end up in the soup above or the drink below!

FIGURE A shows the route from Olympia to Harvey Field. This is a section from a World Aeronautical Chart (WAC); in order to see more detail, you might want to use either a Seattle sectional chart or a Seattle Terminal Area Chart (TAC), both of which show the same area in larger scale.

You'll start from Runway 26 at Olympia, then fly up toward the Tacoma Narrows Bridge. You could continue in a straight line to go to Harvey, but this route would take you close to the heart of the Seattle Class B airspace, and you'd have to get below 1,800 feet to avoid busting this special airspace. Instead, let's cut you some slack so you can enjoy the flight while remaining clear of the most active airspace.

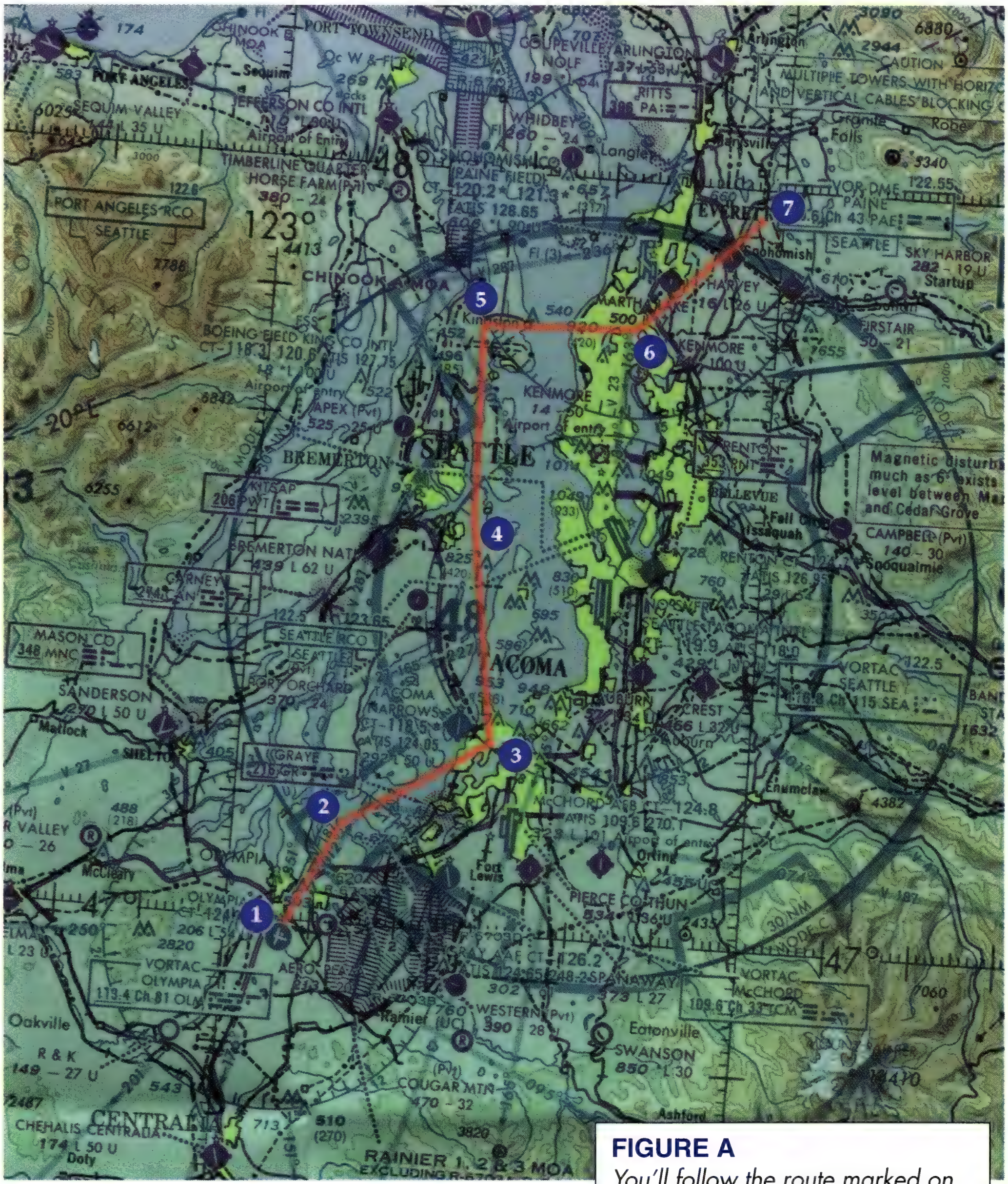
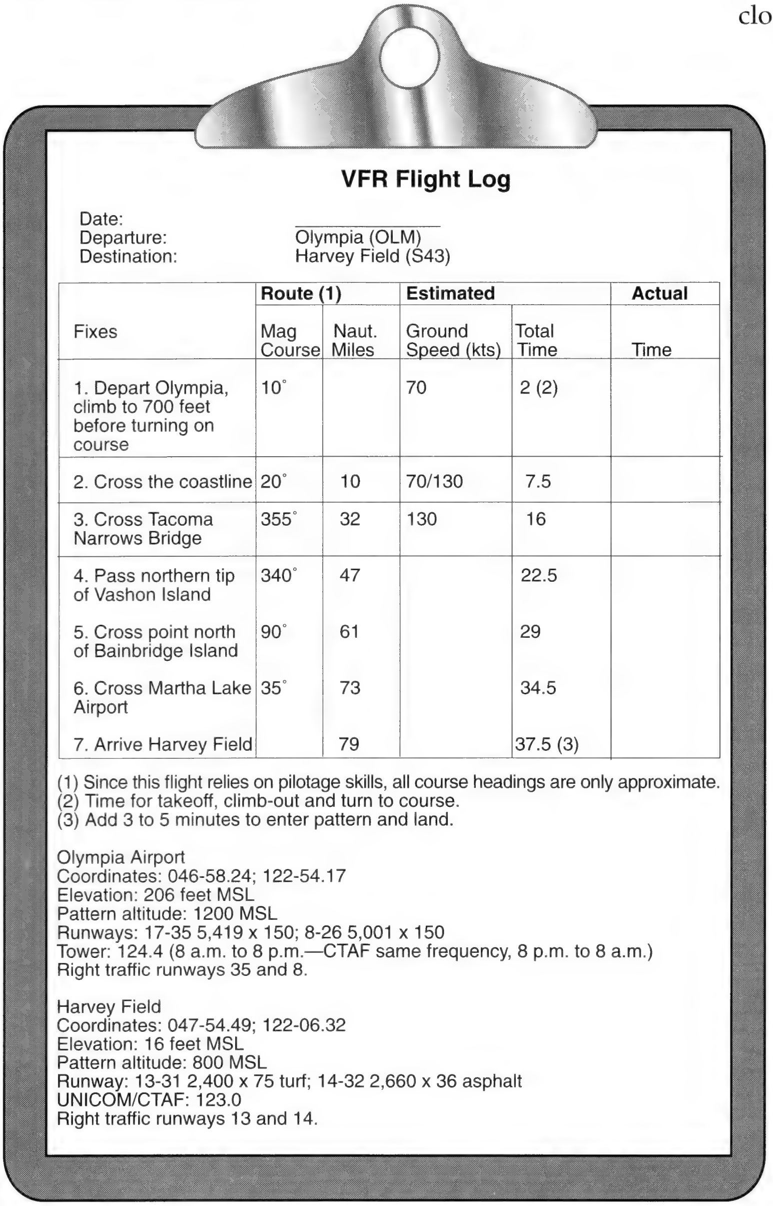


FIGURE A
You'll follow the route marked on this World Aeronautical Chart.

After passing the bridge, you'll turn north and fly along the Colvos Passage between the mainland and Vashon Island. Once you reach the northern tip of Vashon Island, you'll turn a bit to the left and fly past Bainbridge Island. This island is easy to spot because it has three distinct bays along its eastern shore. Just beyond Bainbridge Island, there's a large point sticking out into the Sound toward the east. Once you reach this landmark, you can safely turn back to the northeast and head toward Harvey. One convenient checkpoint along the way is Martha Lake Airport; Harvey Field is just six miles beyond. The airport is nestled into a bend in the Pilchuck River; as the old saw goes, "when you cross the river, you've gone too far."

This route is laid out for you in the flight log shown in **FIGURE B**. Note that the headings are approximate; you'll be relying on visual references to make adjustments to your course headings.



VFR Flight Log

Date: ____________
Departure: Olympia (OLM)
Destination: Harvey Field (S43)

	Route (1)		Estimated		Actual
Fixes	Mag Course	Naut. Miles	Ground Speed (kts)	Total Time	Time
1. Depart Olympia, climb to 700 feet before turning on course	10˚		70	2 (2)	
2. Cross the coastline	20˚	10	70/130	7.5	
3. Cross Tacoma Narrows Bridge	355˚	32	130	16	
4. Pass northern tip of Vashon Island	340˚	47		22.5	
5. Cross point north of Bainbridge Island	90˚	61		29	
6. Cross Martha Lake Airport	35˚	73		34.5	
7. Arrive Harvey Field		79		37.5 (3)	

(1) Since this flight relies on pilotage skills, all course headings are only approximate.
(2) Time for takeoff, climb-out and turn to course.
(3) Add 3 to 5 minutes to enter pattern and land.

Olympia Airport
Coordinates: 046-58.24; 122-54.17
Elevation: 206 feet MSL
Pattern altitude: 1200 MSL
Runways: 17-35 5,419 x 150; 8-26 5,001 x 150
Tower: 124.4 (8 a.m. to 8 p.m.—CTAF same frequency, 8 p.m. to 8 a.m.)
Right traffic runways 35 and 8.

Harvey Field
Coordinates: 047-54.49; 122-06.32
Elevation: 16 feet MSL
Pattern altitude: 800 MSL
Runway: 13-31 2,400 x 75 turf; 14-32 2,660 x 36 asphalt
UNICOM/CTAF: 123.0
Right traffic runways 13 and 14.

FIGURE B
Use this flight log to record your progress.

Next comes the question of how high to fly. The Class B airspace is arranged in layers, and the portion over Vashon Island and the Sound where you'll be flying has a floor of 3,000 feet MSL. You can tell this by the "fractions" on the chart; the indication of 100 over 30 means that the airspace extends from 3,000 feet (30 hundred feet) to 10,000 feet (100 hundred feet) above mean sea level (MSL). You aren't going to fly over that—not without spending an inordinate amount of time climbing and circling outside the Class B airspace—and even if you did, you'd be faced with a 10,000-foot descent at the other end to get to Harvey Field, which is just under the outer edge of the airspace on the other side.

As a result, the only practical approach is to fly under the airspace. Since we're flying near Seattle, we've also dialed in a low overcast for the flight to add some realism and to help you visualize the Class B airspace; stay out of the clouds and you stay clear of the airspace.

With a ceiling of 3,000 feet, Visual Flight Rules require that you remain at least 500 feet below the clouds (or 1,000 feet above, or 2,000 to the side). This distance is designed to give you and the other pilot a moment to react when a plane flying under instrument flying rules (IFR) pops out of the clouds headed in your direction. A look at the chart in **FIGURE A** shows that there are no obstacles along your route that are higher than 1,000 feet, but you'll want to fly high enough to give you some gliding distance in the unlikely event that something goes wrong. So plan to cruise at 2,250 feet. (Note that the hemispheric rule that dictates cruise altitudes based on your course does not apply, since you will be flying less than 3,000 feet above ground level.)

talk of the tower

Since FS5 doesn't simulate air traffic control communications other than takeoff and landing clearances, we are ignoring one real-world airspace requirement on this flight. However, you can act it out if you want to remain strictly legal. The dashed line around the

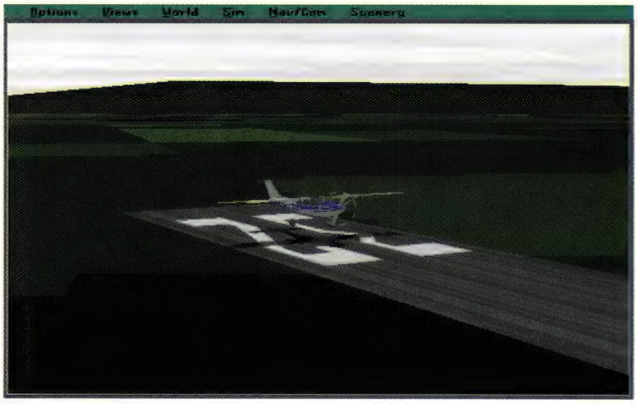


FIGURE C
Harvey Field's runway is long but narrow.

Tacoma Narrows Airport in Figure A indicates that it is Class D airspace with a tower. The airspace extends up to 2,800 feet MSL, and you will be flying right through it. (You also have McChord Air Force Base with its own Class D airspace to the right of your course, and the Tacoma Narrows Class D airspace extends pretty far to the west, which makes a detour impractical.)

To stay legal, you need to be in radio contact with the Tacoma Narrows Tower before you enter the airspace. So tune your COM1 to 118.5, report your airplane's N-number and your position and ask for permission to transition the Class D airspace over the bridge:

> Tacoma Narrows Tower, this is Cessna Two-Zero-Zero-One-Zulu with you seven miles southwest; request permission to transit your airspace.

All you need to hear is the controller repeat back your N-number and you can continue on your merry way.

The only other point to consider is your descent at the other end. The pattern altitude for Harvey Field is 800 feet, which means that you'll need to lose 1,450 feet of altitude. At a standard 500-feet-per-minute descent rate, you'll want to start down three minutes (or more) before you enter the pattern. At 130 knots—the airspeed we used for the flight plan—that would be 6.5 nautical miles out. Conveniently, this figure is almost exactly the distance from Martha Lake Airport to Harvey Field, so begin your descent before you cross Martha Lake and you should be ready to enter the pattern at your destination.

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We'll assume for this flight that the winds are light and variable out of the northwest, so you will depart from Runway 26 at Olympia and land on Runway 32 at Harvey Field. There are a couple of details to note about your destination, by the way. First is the fact that pattern altitude is just 800 feet, which is lower than the standard 1,000 feet used at most airports, so your view of the field will be a little different than you are used to seeing. You may find yourself flying the pattern too close to the field.

The other detail is that the paved runway is just 36 feet wide, as you can see in **FIGURE C** on page 17—only one-quarter the width of Olympia's runways. This narrow landing strip can also wreak havoc with your visual take on the situation, and you may find yourself flaring too late on the landing. (No, you can't log each bounce as a separate landing, either!) You'll be particularly vulnerable to confusion because Harvey Field's runway doesn't have a VASI (Visual Approach Slope Indicator) to help you establish the proper glide path. You'll be a safer pilot if you think about details such as these before your flights.

getting ready to fly

Setup for this trip is easy. Start up FS5 and choose the Airports... command from the World menu. In the Choose A Scenery Area text box in the resulting dialog box, select USA - Seattle and then pick Olympia - Runway 26 from the list of airports.

Next, you need to set up the cloud cover. Choose Weather… from the World menu, and then click the Edit button to change the cloud layer. Change the Base setting to 3,000 feet and the Coverage setting to Overcast. Be sure the Deviation setting reads zero. Click OK twice to return to the simulator. Now would be a good time to save the situation in case you want to make this flight again.

If you want to make the trip more challenging, you can try two modifications. First, you can add some wind. Try a 15-knot breeze from 270 degrees, in a layer from 1,000 to 3,000 feet. (You can even bring it down to ground level if you want to practice cross-wind takeoffs and landings.) You can also add some patchy fog to the Sound by creating an extra cloud layer; try a global layer from 100 feet to 1,000 feet with a 100-foot deviation. You won't have any trouble getting up and down while remaining clear of the clouds, but it can make spotting your visual references a little more difficult.

take off!

That's it—you're ready to go sight-seeing over Puget Sound. Have a great flight, and enjoy the view. But be sure to get your seafood after you get to the airport, not en route. Unless you have floats mounted, a Cessna makes a pretty poor fishing boat!

Contributing Editor Alfred Poor is a licensed pilot and author of the monthly "Aerodrome" column in Computer Shopper magazine.

STUDENT PILOT *by David Harpe*

Maximum performance

Short-field takeoffs and landings

Life would be easier for pilots if every runway were 10,000 feet long and in the middle of a flat desert. In the real world, airstrips are not so conveniently arranged. Some runways are placed in the middle of wooded areas with trees all around. Others are simply short due to the amount of land available.

That's why mastering standard takeoff and landing procedures is only the beginning for skilled pilots. Short-field takeoffs and landings demand different planning and procedures. In fact, short-field performance is a major selling point of many types of aircraft, especially smaller passenger planes, which often service small airports with fairly short runways. For example, the short-field performance of Boeing's 737 and the Beechcraft Super King Air are remarkable.

Of course, light aircraft such as the Cessna 182 enjoy excellent short-field performance; in fact, a standard modification to such aircraft is a STOL (Short Takeoff and Landing) kit that modifies the wings to improve lift and reduce stall speed. Nonetheless, the pilot is often the determining factor in successful short takeoffs and landings with these aircraft. In this article, we'll learn how to take off and land using a small amount of space.

standard takeoffs

We'll use the default Meigs Field situation to practice short-field takeoffs and landings in the Cessna 182 RG. First, we'll practice short-field takeoffs. In a short-field takeoff, the goal is to get airborne as quickly as possible using a minimum amount of runway.

Once airborne, we want to climb away from the runway as fast as possible to clear any potential obstacles in our flight path. (After all, one reason for short runway length is the presence of nearby trees, buildings or other obstacles.) We continue this climb until we reach a safe altitude. Once at altitude, we can return the aircraft to a more "normal" configuration.

Let's look at the elements of a normal takeoff and see how we can minimize the amount of time it'll take to reach flying speed. On a normal takeoff, we taxi onto the runway directly from a taxiway, aligning our aircraft with the runway centerline. After setting the flaps at 10 degrees (although we could decide to take off "clean," meaning no flaps), we advance the throttle and begin our takeoff roll.

Once the airspeed reaches around 55 knots, we pull back on the yoke. The aircraft slowly lifts off the runway as the airspeed climbs, and we adjust the pitch of the nose so that we maintain an airspeed of around 85 knots. We put up the gear, and once we're at a safe altitude, we put up the flaps if they're down.

If we performed that takeoff procedure at Meigs, chances are we'd use only about half of the runway before lift off. At Meigs, the runway is about 4,000 feet long, which means we used around 2,000 feet on the takeoff roll. Our leisurely climb put us at around 100 feet above the ground by the time we were over Lake Michigan. This procedure got us into the air with plenty of power to spare, at the cost of extra distance used. Now, let's look at how to use more power and less distance.

short-field takeoffs

When performing short-field takeoffs, you need to adjust for five variables: runway usage, flaps, takeoff roll, landing gear, and airspeed.

Runway usage. When we initially position the aircraft on the runway, we must make sure that we are using every foot of available pavement. Since the taxiway might not align with the exact end of the runway (such as those for Meigs' Runway 36), we need to taxi in the opposite direction of takeoff to reach the end, then turn around so the plane's nose is pointed in the right direction.

(In the default Meigs situation, this task has already been achieved for us. In fact, if you have dynamic scenery active, you'll notice the dynamic scenery aircraft taxi onto the runway directly from the taxiway in front of you, as shown in **FIGURE A** on page 21.)

Flaps. Let's look at how flap usage affects our takeoff. First, attempt a normal takeoff as described earlier, waiting until you reach altitude to retract the flaps. Now, let's add full flaps and try the same takeoff. You'll notice that the nose of the airplane comes up pretty quickly due to the increase in

Continued on page 21

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Maximum performance

Continued from page 19

lift. But this nose-high attitude also keeps airspeed from building quickly. Full flaps add a great deal of drag, which prevents airspeed from building.

If you try to lift off without enough speed, you stall and settle back onto the runway. Even with full throttle, you'll find that it'll be tricky to get the airplane into the air again without running out of runway. That's why full flaps are generally used only for landing.

While we're beating up our airplane, let's try another experiment. Try the full-flap takeoff again. Once you're airborne, wait until you're about 50 feet off the ground and put the flaps up. If you do this without crashing, you're pretty lucky! Putting the flaps up removes drag, but also removes lift. Since your airspeed is slow and you're low to the ground, the airplane will settle back to the ground very quickly. It's also very easy to stall under these conditions.

The folks at Cessna have determined that the best flap setting to use for a short-field takeoff is 20 degrees. This setting gives the best trade-off between lift and drag. As our earlier experiment pointed out, we'll also have to be very careful about putting the flaps up too quickly.

Takeoff roll. Now, let's look again at the takeoff roll in a normal takeoff. We advance the throttle, allowing airspeed and engine RPM to build as we roll down the runway. When we reach 55 knots, we pull back on the yoke (or *rotate*) to lift the nose up and start a climb. The first part of our takeoff roll is not made under full power, even though we have the throttle at full. This is because it takes a while for the engine RPM to build.

To minimize the effect of this delay, we can lock the brakes on the aircraft before we advance the throttle. This keeps the airplane from moving until we release the brakes, which we'll do when the engine RPM is up to full speed. This procedure keeps us from wasting valuable runway while waiting for the engine to come up to speed.

Landing gear. When we start our normal takeoff climb, we wait a little while before we put up the landing gear—until we have both a positive rate of climb and no more usable runway. This delay gives us a little time to put the airplane back down on the runway if we should experience problems.

In a short-field takeoff, we don't need this safety margin. Presumably, the runway is already fairly short, so once we start rolling we probably won't be able to stop before we hit something. So in a short-field takeoff, we can put the gear up very quickly. Doing so eliminates drag quickly, giving us extra energy to use in our climb.

Airspeed. In a normal departure climb, we use 85 to 90 knots as a target airspeed. This speed gives us a nice, comfortable rate of climb while keeping the nose pitch fairly shallow so we can see other traffic and keep the engine cool. In a short-field situation, we don't have this luxury—we need altitude and we need it fast. So we'll use 65 knots as a target airspeed until we're clear of any obstacles around the airport. To maintain this airspeed, we'll have to pull back on the yoke quite a bit, which will pitch the nose up fairly high. Don't be surprised if your view is restricted to nothing but sky as you depart Meigs—short-field takeoffs are no time for sightseeing anyway.

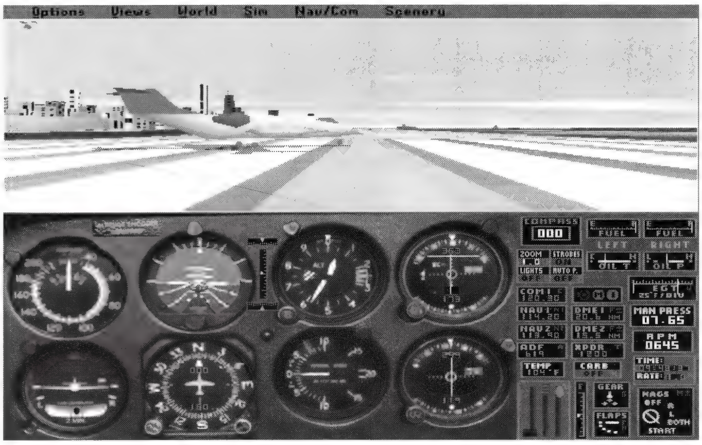

FIGURE A
The default Meigs situation places you in a good position for short-field takeoff. You can pretend you're avoiding the wake turbulence of the dynamic scenery Learjet.

ready to try it?

Okay, let's try one for real. Reset the scenario, and lock the brakes by pressing [Ctrl][.]. Click the center dot in the flap position indicator, as shown in **FIGURE B**, to set flaps at 20 degrees. (There's no keyboard command for 20 degrees of flaps.) Press [F4] to go to full throttle. Watch the tachometer until the engine speed stabilizes, and then press [.] to release your brakes.

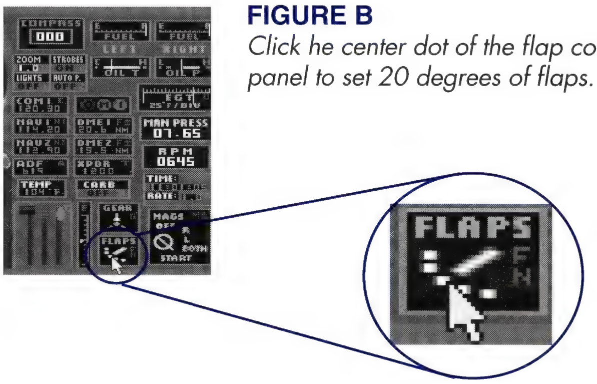

FIGURE B
Click he center dot of the flap control panel to set 20 degrees of flaps.

Watch the airspeed gauge closely. When it reaches 55 knots, pull back on the yoke. As soon as you see the altimeter start to climb, press [G] to retract your landing gear. Continue to pull back on the yoke to keep the airspeed around 65 knots. Once you're at 800 feet or so, retract your flaps to 10 degrees and pitch the nose down slightly to build airspeed.

When your airspeed reaches about 90 knots, retract the flaps fully. Take a look around and you'll notice that you're hardly clear of the field and you're already several hundred feet above the ground. Congratulations! You've just finished your first short-field takeoff.

short-field landings

The goal of a short-field landing is to land and stop as quickly as possible due to the limited amount of runway. The trick to accomplishing this feat is precise control of airspeed. Let's make a normal landing first, just to get started. We'll save our situation about a mile before we land so we can return to the same point several times for practice.

Start from the default Meigs scenario. Depart Meigs and execute a 180-degree turn, stabilizing your altitude at around 1,100 feet MSL. Once you're a few miles away from the end of the runway, turn back around and align with the center of the runway. Slow down to around 70 knots and apply full flaps. You should be positioned about a mile away from the runway, at an altitude of around 1,000 feet, airspeed 70 knots and full flaps, as you can see in **FIGURE C**. Press the [P] key to pause FS5, and then save the situation by choosing the Save Situation... command from the Options menu (or pressing the [;] key) and assigning a situation title in the resulting dialog box.

On a normal landing, you would reduce power to almost idle, gliding in at around 65 knots until you crossed the threshold. You would flare the aircraft by pulling back on the yoke at about 30 feet off the ground. As you reduced power, the plane would settle gently onto the runway. After landing, you'd hold the nose off the runway by pulling back on the yoke. If you found yourself getting close to the end, you might tap the brakes to stop. Practice this landing using your saved situation to get familiar with the feel of it.

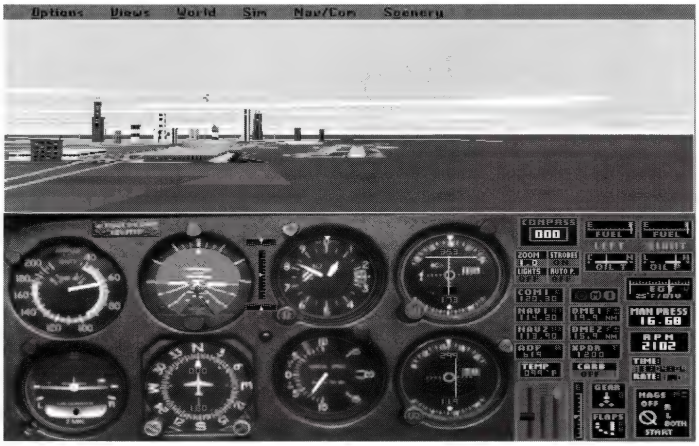

FIGURE C
We'll practice short-field landings from this point.

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Microsoft 6, 32

Although comfortable for passengers and gentle on the airplane, the standard landing technique uses a great deal of runway. To minimize the amount of runway we use, we must quickly and firmly get the airplane onto the ground. Once we're there, we must slow down as quickly as possible by applying heavy brakes.

Now, let's try a short-field landing. Reset your saved situation and take Flight Simulator out of pause. You're now at about 1,000 feet and a mile away from the runway. Quickly establish an airspeed of around 65 knots with full flaps. Maintaining this configuration will require a nose-high attitude and a little excess power. Keep the airplane coming down fairly quickly—don't get worried if the rate-of-climb indicator shows a fairly steep descent. Watch the runway to make sure you're going to land right on top of the numbers.

Once the airplane crosses the numbers, chop the power by pressing [F1] and drop the nose by pushing forward on the yoke. The airplane will land a little roughly and may bounce back into the air. Quickly press [Ctrl][.] to set the brakes. Keep the nose down to minimize bounce. Once the airplane stops, take a look behind you. You'll be surprised at how little runway it takes to land using this method.

conclusion

We've gone through the steps necessary to carry out maximum-performance takeoffs and landings. For further adventures, try using these techniques at other fields. An easy way to gauge your success is to use a large airport like O'Hare and try to land or take off before arriving at a runway intersection. For an added challenge, try using the short-field techniques to land on or take off from the aircraft carrier in San Francisco Bay!

Build your own rudder pedals

by Robert Kaup

I had my first experience with Flight Simulator in late 1983 with version 2, on an Atari 800 with 16K of RAM, which limited the display—you couldn't even see your wings from the side windows! A year later I purchased an Atari 130XE, which had 64K of RAM.

Although now I could at least see my wings, flying was a real pain because of Atari's nonproportional joystick. Learning to land took forever because you couldn't move the control surfaces just a little and hold them there. You had to "bump" the joystick to move the control surface and then bump it back the other way to stop the motion. Not too much later, I purchased a joystick driver that added proportionality to the ailerons and elevator, making the airplane much easier to fly. Rudder control was still by keyboard only.

Last year, I bought an 80486, and of course I had to have FS5. The transition from version 2 to version 5 was easy, and with the program's rudder pedal capability, I knew I had to have rudder pedals. "Pretty expensive item," I thought to myself. "There has to be a way to build my own."

I tried a few different designs; the one you see here worked best. It's so inexpensive that I'm sure it will be the cheapest piece of hardware you own. You'll love what it does for all the simulations you have that support rudder control.

Of course, you'll have to invest a lot of hard work and loving care in these pedals, but when you're finished, you'll feel like the proud owner of a homebuilt airplane. This article assumes that you're familiar with basic construction and wiring techniques; if you aren't, a good book on home repair should provide all the information you'll need.

So, where do you start? First, look around the house. You may have a lot of what you need already in stock. Then, head down to your local electronics store and pick up the 100K potentiometer ("pot") and the knob. Next, stop by your local hardware store for the hardware items: hinges, pulleys, brackets and a bolt.

If you know someone who's building a house, you might want to pay that person a visit on the way home. Such a visit enabled me to pick up enough scrap lumber for the four units I've built to date. Of course, a hardware or building supply store can also provide the lumber.

Cut the wooden parts to the dimensions shown on the diagram in **FIGURE A** on page 24 (the diagram isn't to scale in order to help show more detail). You must alter two parts from the rough dimensions given in the parts list. The rocker needs a ⅝-inch-radius rounded surface on the top of each end with about ⅜ of an inch of material removed from beneath the rounded tops.

what you need

Use ¾-inch pine board or plywood for all wooden parts

Quantity	Item
1	11-inch x 18-inch wood base
2	3-inch x 5-inch wood pedals
2	2¾-inch x 5-inch wood pedal stops
1	1¼-inch x 7-inch wood rocker
1	271-092 100K ohm linear taper potentiometer
1	274-424 knob for ¼-inch shaft
2	2½-inch hinges
2	small pulleys
1	¼-inch bolt 2 inches long, with 2 hex nuts and washers
2	1½-inch corner brackets
2	1¼-inch x ¾-inch springs (I took mine from old automotive radiator caps)
1	Joystick Y connector or 15-pin D-sub joystick male connector with all 15 pins
1	Two-wire plug

Wood screw assortment
Keyhole saw
Sander or sandpaper
Screwdrivers, a chisel and assorted tools

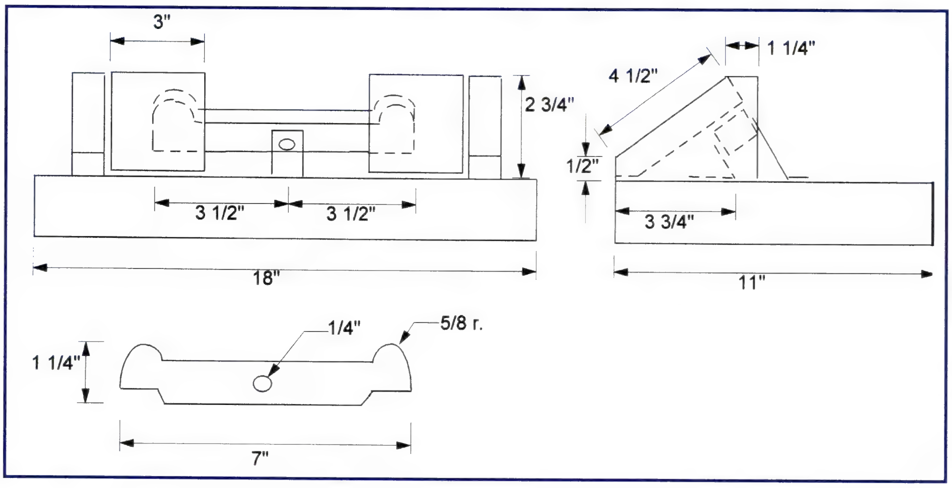


FIGURE A
Cut your wood to match the parts shown in this diagram.

You change the pedal stops as follows: Looking at the rocker from the side, measure up a half-inch from the lower-left corner and make a pencil mark, and then mark a spot 1¼ inches below the upper-right corner. Connect the two points and cut along this line.

Refer to the photo in **FIGURE B** to help get an idea of how the parts look. (My base is angled 90 degrees toward the back because I have a corner workstation and the unit sits in the corner.) Mark the center of the long side of the base, then mark a spot 3½ inches from each side of the center mark. These marks are the center points for the pedals.

Center the hinges on these outer marks and attach them to the base with the hinge pin about one inch in from the edge. The pedals should have a 45-degree angle cut across the bottom; you'll attach the angled side of the pedals to the other side of the hinges. Position the rocker about a half-inch from the top of the pedals and attach one of the corner brackets on the base centerline with the corner 3¾ inches from the front of the base.

Then, bend the bracket carefully so that the rocker top matches the angle of the pedals. Use the pedal stops to determine the correct angle of the pedals to the base. Once you have this angle set pretty close, bend the other angle bracket to support the other side of the rocker. Secure the rocker with the ¼-inch bolt. Mark the areas on the base where the springs will go, chisel shallow pockets in the base for them to sit in, and then set the springs under each side of the rocker.

You can now attach the pedal stops to the base. Place the stops in position under the pedals. Leaving an ⅛-inch gap, outline the stops with a pencil, drill holes through the base and then attach the stops with screws.

The next step is one of the most difficult: Fashion the mount for the potentiometer out of a piece of sheet metal or other suitable material. The photo in **FIGURE C** illustrates the mounting of the pot, the position of the pulleys and the connection of the control line to the rocker.

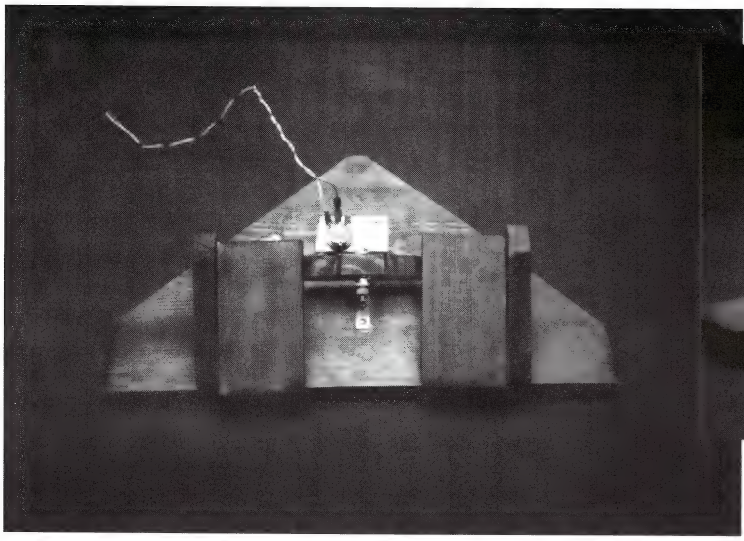


FIGURE B
This photo shows how the wooden parts fit together.

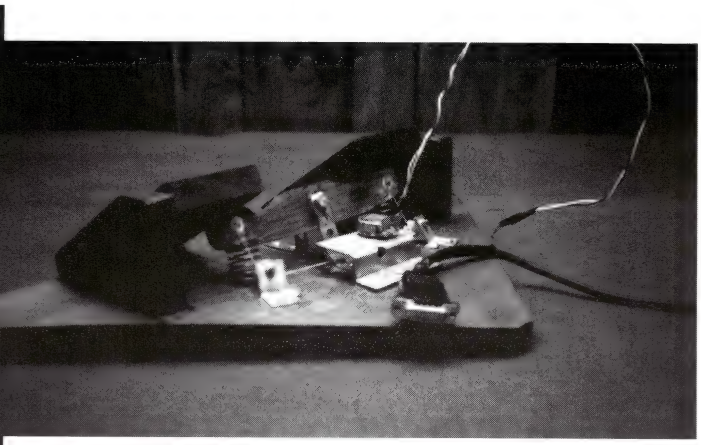


FIGURE C
You can see the mounting of the electronic parts in this photo.

Position the pulleys so that the control line runs straight from the rocker to the pot. Attach the line to one end of the rocker with a wood screw, thread it through the first pulley, wrap it around the knob twice, thread it through the second pulley and then attach it to the other side of the rocker.

Before you tighten the line, adjust the pot to read 50K ohms when the pedals are even with the pedal stops. The resistance between the center terminal and one of the outer terminals should increase with a right turn. When this task is accomplished, connect your wires to these terminals.

wiring

You must consider two options when connecting the pedals to your computer: soldering the rudder pedals' wires directly to your joystick or attaching them via a Y connector. If you have a 15-pin D-sub connector on your joystick, with all 15 pins, you can connect the pedals directly to it. I built a rudder unit for my friendly Radio Shack dealer, and he bought a few Fashion Sticks for me to use. This joystick is not a high-quality model, but it does have the 15-pin connector I needed. Cut the cable behind the plug and pull the connector out of the plug. Then, remove all wires from the plug.

With a ¼-inch drill bit, drill the material out of the rubber plug housing to make room for the wiring. Remove the plug from your good joystick and then use an ohm meter to test your joystick wires, making a numbered, color-coded list of the wires. Your sound card or game card manual will contain a Game/MIDI Port specifications page that will help you to determine where the wires should be connected and what each wire does.

For example, wires 1 and 3 should show a change of resistance when moving the joystick right to left; wires 1 and 5 should show the change when moving the joystick forward and back. Wires 2 and 4 and 4 and 7 should show the change when their respective buttons are pressed: 2 and 4 is button one and 4 and 7 is button two.

Rewire the plug following your color-coded list, adding two wires to pins 9 and 11. Note that the pins on the connector are numbered 1 to 15, which should help prevent improper hookups. The added wires go to the two-wire plug and then to the pedal potentiometer. **FIGURE C** shows the added plug that goes to the pedals.

If you don't want to cut and resolder your current joystick, you'll need to purchase a joystick Y connector. Flight Sim Central (a national computer game retailer) sells this item for $11.95; their phone number is (800) 477-SIMS. Solder the appropriate-sized pins to the pedal wires and just plug them in. By the way, the printer cable for an Apple IIc computer also uses the same 15-pin connector and can be rewired easily—it can be disassembled just by removing two screws.

Putting your pedals to use is the easy part. In FS5, toggle off the Auto Coordination setting under the Sim menu. Then, choose the Preferences... command from the Options menu. In the resulting dialog box, click the Joystick button, and then set the second joystick control to Rudder Only. Set the rudder sensitivity to 3 or 4 and the null zone to 3, and then give your new pedals a test. These settings should give the pedals a good feel that isn't too sensitive. Most other programs let you select your rudder control during the installation process. All you need to do is follow the onscreen instructions to enable the rudders.

There you go—you should now be ready to fly with your new rudders. If you enjoyed the process, you might be tempted to build your own airplane to go around them!

Full Throttle *subscriber Robert Kaup is a bus mechanic in Celina, Ohio. He's an avid radio-control pilot and hopes to own an airplane someday.*

Join the online flight line

(Continued from page 14)

mary information for each file; you can then choose to download the file immediately or flag it for later retrieval. Clicking the List More Files button lets you scan through the library's full complement of FS5-related files.

Returning to the main Flight Simulation Resource Center screen, choose the Message Board option. In the resulting dialog box, click the List Categories button. You'll see a list of topics similar to the one in **FIGURE L** on page 14. From this dialog box, you can enter discussions on many types of flight simulators.

Besides its rich flight simulation forum, AOL also offers a free electronic mail gateway to the Internet. This function lets you communicate with other simulation enthusiasts across town or across the globe.

conclusion

Computer flight simulators such as FS5 open up an entire virtual world of aviation opportunities. Online services can provide all the services of a major airport for computer pilots by featuring technical support, utilities and even a place where veteran pilots can exchange their favorite stories and brag about their flying feats. Although commercial online services come with a price tag attached, you might find the resources available worth the cost. In fact, you might even find yourself spending more time online with other computer pilots than in your simulated cockpit.

CompuServe Information Service
Customer Service
(800) 848-8990
CIS: $8.95/month base price
One month free trial
Connect time charges vary with modem speed

America Online
Customer Service
(800) 827-6364
AOL: $9.95/month base price
10 hours free trial
$3.50/hour connect time

Control havoc in the skies with challenging CD-ROM game

To pilot an aircraft, you have to have hours of training, an alert mind, thorough knowledge of the regulations and steady nerves. Air traffic controllers must possess those attributes in spades, since they're responsible for the safety of not just one aircraft but many of them at the same time.

Now a CD-ROM game presents the challenges of air traffic control in a busy airspace where the slightest error can doom hundreds of commuters. Air Havoc Controller, a Microsoft Windows-based game by Trimark Interactive, lets you guide commercial and military aircraft to, from and around your airport. The only tools at your disposal are your radio, the radar scan of your airspace and your ability to stay sharp in the midst of chaos.

But an Air Havoc Controller session doesn't consist solely of chasing radar blips around your screen. More than 30 minutes of remarkable three-dimensional animation gives you a close-up view as aircraft take off and land—or veer away from each other in a near miss. Computerized pilots' voices crackle over your speakers. Meanwhile, an out-the-window display depicts aircraft leaving and arriving at the gates and taxiing to the runway.

Controllers can customize the difficulty of their tasks, from a routine routing of five planes in a 10-minute session to the chaos of 60 jets crowding the skies in a half-hour span. The higher difficulty levels can challenge the wits and reflexes of even the most seasoned video game master.

Although Air Havoc Controller isn't compatible with Flight Simulator 5, it's sure to appeal to computer aviation enthusiasts. Let's take a closer look at this exciting game.

radar love

New controllers begin by following the simple installation procedure. Air Havoc Controller's setup program checks the CD-ROM drive and computer speed, copies about one megabyte of files to the hard disk directory that the user specifies and then creates a program group and icon for the game. From that point, the game's excitement is just a mouse click away.

After you double-click Air Havoc Controller's program icon, you'll see a pair of title sequences and then the game's main interface, shown in **FIGURE A**. As you can see, the interface resembles a sleek, high-tech desktop with a computer, VCR and even some printed books.

You just click one of the screen areas to access its particular function. (When you point to a screen area with the mouse, text appears that describes the area's function.) For example, clicking the computer monitor begins a new game, while clicking the car keys ends your Air Havoc Controller session. The VCR is your gateway to Air Havoc Controller's image library, while the books take you to the program's aircraft encyclopedia. We'll discuss the latter two elements of the game later.

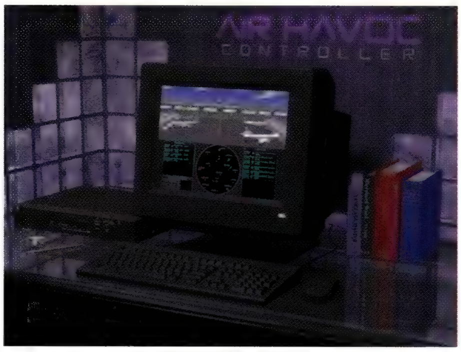
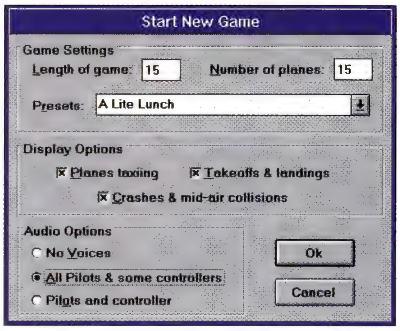


FIGURE A
The main Air Havoc Controller interface resembles a modern desktop.

The opening screen also serves as a preview of the remarkable graphics that comprise the program. As you can see from the figures in this article, the graphics are of nearly photographic quality. These carefully rendered images are the norm throughout the program.

Air Havoc Controller is designed to be easy for gamers who like to begin a game immediately without wading through a pile of instructions. The game's manual is a simple eight-page CD insert that describes the setup procedure. Once you have the game running, thorough game play information and hints are available when you press the [F1] key to activate Air Havoc Controller's online help system (you can also invoke the help system from Air Havoc Controller's program group). But why wait any longer—let's start a game session.

To begin a game, all you do is click the monitor and either accept or edit the settings in the resulting Start New Game dialog box, shown in **FIGURE B**. This dialog box lets you customize the length of the game and the num-



Start New Game

Game Settings
Length of game: 15
Number of planes: 15
Presets: A Lite Lunch

Display Options
☒ Planes taxiing
☒ Takeoffs & landings
☒ Crashes & mid-air collisions

Audio Options
○ No Voices
● All Pilots & some controllers
○ Pilots and controller

FIGURE B
You determine the difficulty of your game in this dialog box.

ber of aircraft you'll have to control either by entering numbers into their respective text boxes or by choosing from a dropdown list of preset scenarios.

The other settings in this dialog box provide a hint of Air Havoc Controller's capabilities. For example, you can toggle the display of takeoffs, landings and accidents; you can also specify how the game uses its digitized voice capabilities.

After you click OK, you'll see the game interface screen shown in **FIGURE C**. This screen provides all the information you'll need in order to control dozens of commercial and military aircraft in your 30-mile-diameter airspace.

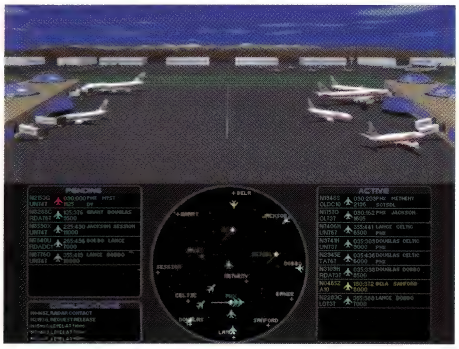


FIGURE C
The main game screen includes your radar display and an out-the-window view of the parking area and runway.

At the top of your screen, you'll see an out-the-window view of the virtual Phoenix airport at which you're stationed. During the game, aircraft taxi to and from the gates and along the taxiway. While this display is often cosmetic, keep an eye on planes pulling away from the gate—they can be your advance warning of impending departures, which can help you plan for more efficient traffic flow.

The left and right sides of the screen provide a trio of information windows. The one in the upper left, marked "Pending," is the list of aircraft that you haven't yet acknowledged. This list includes planes taxiing to the runway and aircraft that have just entered your airspace. You'll know to acknowledge a given flight when you hear the computerized pilot's voice either announce the flight's entry into your airspace or request takeoff clearance. Once you click the airplane's information strip to acknowledge it, it appears in the "Active" list on the right; you can then issue commands to that aircraft. There's also the Communications window, which we'll return to shortly.

Each aircraft's information strip contains details vital for guiding it to its destination. **FIGURE D** depicts the two types of information strips you'll see in the game. In each, the left-hand column contains the plane's call sign and type; the center column (to the right of the airplane silhouette) includes the plane's heading, speed and altitude; and the right-hand column lists the plane's origin and destination. The two types of strips differ only in the right column, which contains information about a plane's destination.

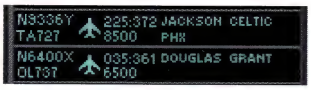
The strips let you glean important information about a given airplane at a glance. For example, the airplane shown at the bottom of **FIGURE D** is a 737 on a course of 35 degrees, traveling at 361 miles per hour at 6,500 feet; it's proceeding from waypoint Douglas to waypoint Grant. The airplane at the top of **FIGURE D** is a 727 on a course of 225 degrees, flying at 372 miles per hour and 8,500 feet; it appeared at waypoint Jackson and must be directed to waypoint Celtic before being routed to the Phoenix airport for landing. We'll discuss how you use these waypoints in a moment.

The final information display, marked "Communications" and situated at the lower-left side of your screen, is a textual representation of the communications between you and the aircraft. It lists the last five communications and is a useful backup to the voice communications. (It also allows users without a sound card to play the game.) However, at higher difficulty levels the communications, like the aircraft, fly thick and fast; messages can scroll off the communications window in almost no time.

While the information strips are helpful, your chief tool in the game is the radar display, shown in **FIGURE E**. You're responsible for controlling traffic arriving at and departing from three airports: Phoenix's Sky Harbor International Airport (situated in the lower half of the screen and designated PHX), the nearby Scottsdale (right of center and designated SCTSDL) and Deer Valley (in the top-center position and designated DV) airports.

You'll notice a white line extending from each of the airports on the radar screen. These are the landing vectors; you must direct aircraft to fly along these vectors at a certain altitude before you can transfer responsibility for the flight to that airport's control. The white crosses scattered around the radar screen are radio waypoints; directing incoming flights to one of the waypoint beacons near the center of the display makes lining them up on the appropriate landing vector an easier task.

You'll also direct flights that are just passing through your airspace. In these cases, you'll direct the aircraft to one of the nine radio waypoints arranged along the radar screen's perimeter. As the aircraft approaches the waypoint, you must remember to



```
N9336Y  225:372 JACKSON CELTIC
TA727   8500    PHX
N6400X  035:361 DOUGLAS GRANT
OL737   6500
```

FIGURE D
These information strips help you direct traffic safely.

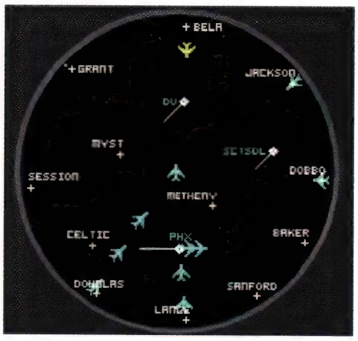


FIGURE E
Your radar is your main tool for avoiding collisions.

"hand off" the flight to an imaginary neighboring controller. Again, flights must be proceeding at a predetermined altitude before you can hand them off.

Aircraft appear on the radar display as blue icons. When you click one with the mouse (prior to issuing a command to the plane), the plane and its information strip turn yellow, allowing you to spot the selected aircraft at a glance.

play it simple and safe

Depending on the difficulty level, merely shepherding the aircraft to their destinations can seem an intimidating task at first. But Air Havoc Controller's simple control interface lets you command several flights at a time using only a mouse.

Clicking the right mouse button on one of the information strips invokes a menu from which you can choose to change the aircraft's heading, altitude or speed. Choosing one of these categories calls up another dialog box in which you specify the new setting. The menu also includes a "Direct To" command that lets you instruct planes to fly directly toward a waypoint that you select.

Once you've selected an aircraft, you can also press special "hot keys" on the keyboard to invoke the dialog boxes without accessing the initial menu. Although you can control Air Havoc Controller using only the mouse, these keyboard shortcuts can help you direct traffic more efficiently.

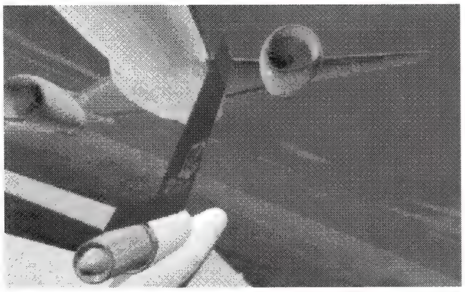


FIGURE F
Letting planes get too close can result in a near miss—or worse.

But mastering control of the aircraft is only part of the story. You also need to obey safety rules and keep at least 1,000 feet of altitude between aircraft that are within three miles of each other. If you allow planes at the same altitude to stray too close together, the simulation can respond with a "separation conflict"—a near miss, as shown in **FIGURE F**—or worse, a mid-air collision. The program also contains a few surprises, such as the rogue pilots that seem to take over military jets that fly too close to other planes.

The game's score is based on how efficiently you direct the planes under your control. You begin with 1,000 points; having aircraft fly in circles or failing to hand a plane off results in a loss of points. Massive mid-air collisions caused by your carelessness cost your score many more points.

Even if you cope with the worst air traffic tangles, disaster can still strike. Planes can crash at random on takeoff or landing. However, these crashes don't affect your score.

in 3-D

We mentioned earlier that Air Havoc Controller features more than just aircraft icons gliding across a radar screen. You also get to watch takeoffs and landings at your airport through the game's video capability.

Air Havoc Controller comes with digitized animations of takeoffs and landings for all of the 13 types of aircraft in the game. Further, the virtual airport at which you work is serviced by six imaginary airlines—Celestial, Localia, Olympia, Royal Dover Airways, Tiger Air and Universal—each with their own unique paint schemes and tail art. Air Havoc Controller's video library contains animated takeoffs and landings of similar aircraft in different paint schemes, so when you clear an Olympia Airlines DC-10 for takeoff, you see it racing down the runway a few seconds later, as shown in **FIGURE G**.

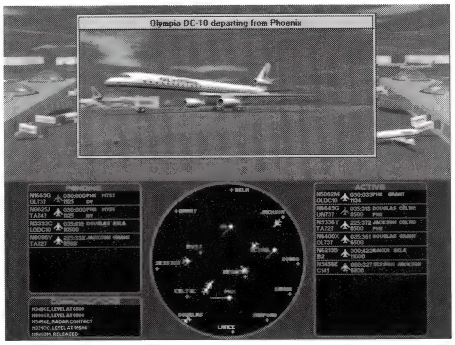


FIGURE G
You're treated to exciting animation as planes take off and land.

Animated sequences also force you to witness the fruits of your carelessness as aircraft crash after you've led them too close together. Random runway crashes also appear as animated sequences.

Since the images in Air Havoc Controller are the result of a three-dimensional computer drafting process, the animated sequences don't play from a static perspective. Instead, the virtual camera pans and zooms for dramatic angles on takeoffs, landings, near misses and accidents. The sequence in **FIGURE H**, on page 30, shows several frames of a typical takeoff animation; notice how the perspective changes as the computerized 737 races down the runway.

Furthermore, the animation is smooth, despite the complex and colorful images depicted. The default speed of 10 frames per second is more than adequate, but a text file accompanying the program describes a simple one-step process of editing the program's initialization file to provide 15-frames-per-second animation on faster computers.

other features

Air Havoc Controller's use of animation is among its most impressive features. Fortunately, the program provides a way for you to enjoy its realistic graphics and animation without being distracted by a dozen jumbo jets converging on your airport.

By clicking the VCR in the main program interface, you can call up dramatic full-screen stills of the program's aircraft, shown in **FIGURE I**, also on page 30. The VCR also lets you play the animations of takeoffs, landings and crashes, as well as

Continued on page 30

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Control havoc

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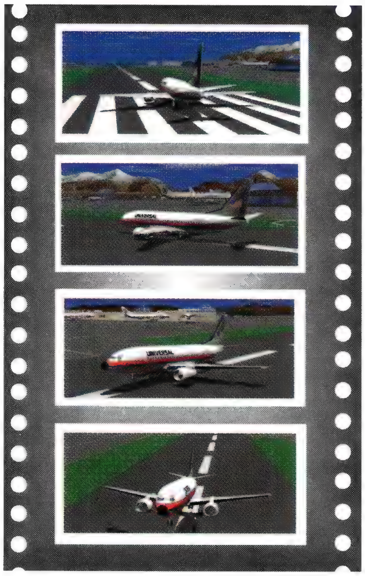


FIGURE H
Air Havoc Controller's animation offers many dramatic perspectives of the program's aircraft.

FIGURE I
You can view full-screen portraits of the program's aircraft and scenery.

several animations not seen in the game, such as footage of an Apache helicopter or a preview ofan upcoming game from Trimark.

The program also includes an encyclopedia of the various types of aircraft that are included in the game. Encyclopedia entries include views of the aircraft from three perspectives, along with pertinent information, as you can see in **FIGURE J**; you can also switch to a three-dimensional "hangar" view. The aircraft information can be useful in playing the game—for example, knowing an aircraft's top speed can help you decide how to route it among faster traffic.

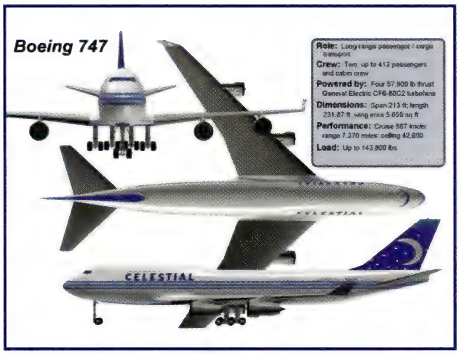
All this graphical detail is possible because of the vast storage capacity of the CD-ROM. Air Havoc Controller uses the huge storage capacity to great advantage. The program's opening and closing sequences feature an original musical score, and takeoff and landing animations come complete with sampled stereo sound.

Furthermore, if you leave the program running unattended for a short length of time, Air Havoc Controller kicks into a screen-saving display mode. The program begins displaying animation clips from its video library; it also presents full-screen animated sequences of activity around the Phoenix airport, from a 747 soaring over a busy freeway on its way to land or an aerobatic airshow performed by daredevil military pilots.

limitations

Air Havoc Controller is not compatible in any way with Flight Simulator 5; nor does it allow you to connect to any other flight or air traffic control simulation program. Also, it offers only limited customizability; the user can't configure the weather or time of day, for example.

The program requires Windows 3.1 or higher, a 256-color video card and a double-speed CD-ROM drive. Trimark Interactive's technical support department reports that for best results, users should have the Super VGA 640x480 256-color driver (available with Windows for Workgroups but not Windows 3.1) installed in their computer.



Boeing 747

Role: Long range passenger / cargo transport
Crew: Two, up to 412 passengers and cabin crew
Powered by: Four 57,900 lb thrust General Electric CF6-80C2 turbofans
Dimensions: Span 213 ft; length 231.87 ft; wing area 5,650 sq ft
Performance: Cruise 567 knots; range 7,370 miles; ceiling 42,650
Load: Up to 143,800 lbs

FIGURE J
The aircraft encyclopedia is useful for, among other things, determining your aircraft's top speed.

Despite the program's overall excellent quality, it nevertheless could stand slight improvements in a number of areas. For example, the sound effects provided with the animation clips are highly realistic, but the sequences involving crashes often include the screams of the virtual passengers as they plummet to their doom. While this feature can be entertaining if the game is treated as an unrealistic simulated lark, the screams could be considered in poor taste. A toggle switch to remove the screams from crash sequences would be a welcome addition.

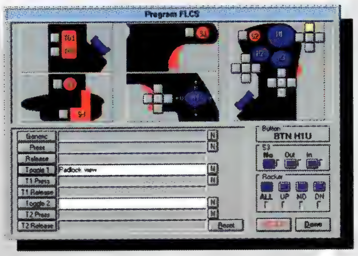
Other minor items on the wish list include a method to save a record of one's score to disk. While users might not want to be reminded of some of their more disastrous sessions, achieving a high score after directing 20 planes in 20 minutes is a worthy achievement.

Gameplay mechanics could be improved if controllers were able to issue altitude, speed and heading commands to an aircraft from a single screen. Currently, the controller must invoke three separate dialog boxes to issue these commands; even when using the hot keys, navigating all those dialog boxes can slow the process and lead to inadvertent catastrophe.

Also, the Communications window lists only the five most recent transmissions—and since pilots often read back your instructions, the listed communications can be redundant. It would be nice to be able to scroll back through the communications list, the way a controller can scroll through the airplanes' information strips when the number of active aircraft exceeds the space available in the display.

None of these issues interfere greatly with the enjoyment of the game, however. Air Havoc Controller can provide hours of tension-filled excitement as virtual controllers answer the challenge of clearing the crowded air corridors. The reward of watching the majestic jets land after you guide them safely through the hazardous skies only adds to the fun. With its library of graphics files, animations and encyclopedia information, Air Havoc Controller offers almost unlimited entertainment for aviation enthusiasts.

FLIGHT SIM CENTRAL



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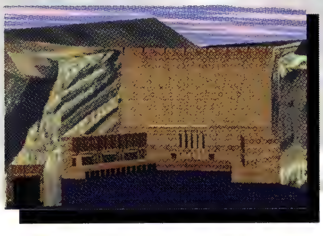

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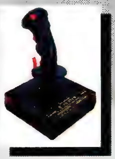

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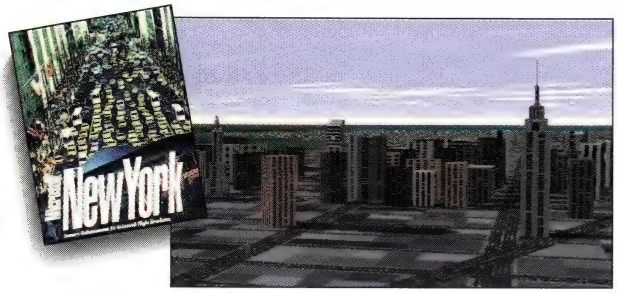

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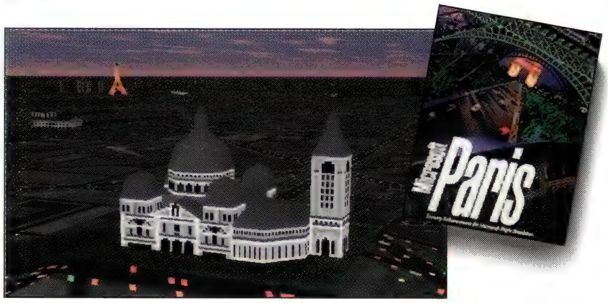

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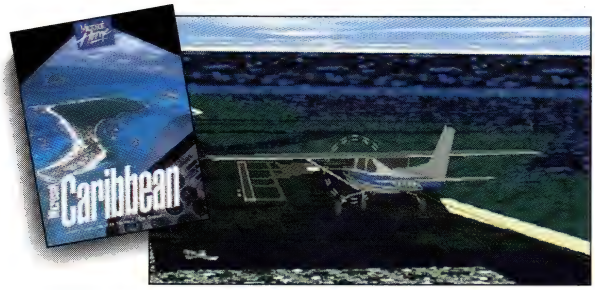

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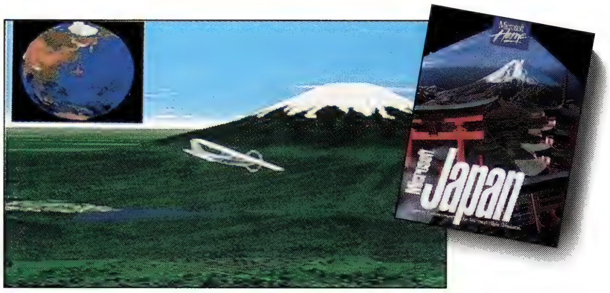

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